



F. No.:2-1/2021-NVS (Estt.I)/ 1645

Dated: 29.06.2022

NOTIFICATION

LIMITED DEPARTMENTAL COMPETITIVE EXAMINATION FOR PROMOTION TO THE POST OF PRINCIPAL AND VICE-PRINCIPAL AND LIMITED DEPARTMENTAL EXAMINATION FOR PROMOTION TO THE POST OF POST GRADUATE TEACHERS

Samiti proposes to conduct Limited Departmental Competitive Examination (LDCE) for promotion to the post of Principal and Vice Principal and Limited Departmental Examination (LDE) for promotion to the posts of Post Graduate Teachers by inviting ONLINE applications from the eligible candidates. The eligibility conditions as per Recruitment Rules in vogue are as under:

I. FOR PRINCIPAL [LDCE] :

"Employees having 08 years combined regular services as PGT in Level-8 (Rs.47600-151100) in the Pay Matrix & Vice-Principal Level-10 (Rs.56100-177500) in the Pay Matrix, put together, out of which minimum 02 years as Vice-Principal."

II. FOR VICE PRINCIPAL [LDCE]:

"PGTs in Level-8 (Rs.47600-151100) in the Pay Matrix with 03 years of regular service."

NOTE: In case of PGT (Computer Science), only such PGT (Computer Science) are eligible to appear in LDCE who possess B.Ed. degree.

III. FOR POST GRADUATE TEACHERS [LDE]:

"From among eligible TGTs having three years regular service as TGT in NVS with Master's Degree in concerned subject, subject to qualifying a departmental examination to be conducted by Samiti;

The feeder posts as TGTs for promotional posts of PGTs shall be as under:

TGT (Maths)	PGT (Maths/Physics/Chemistry) subject to the condition that the concerned teachers have studied PCM at graduation level and Post Graduation in Physics/Chemistry/Maths).
TGT (Science)	PGT (Biology/Chemistry)
TGT (SSt)	PGT (History / Geography)
TGT (Hindi)	PGT (Hindi)
TGT (English)	PGT (English)

Note: Promotion of TGTs to PGTs shall be governed by availability of vacancy in a particular subject irrespective of seniority as TGT.

2. **The cut off date for eligibility criteria for aforementioned posts of Principal, Vice Principal & Post Graduate Teachers will be the closing date of submission of online applications. Candidates possessing the essential qualification/service as on cut off date only will be eligible to appear in the LDCE/LDE (Computer Based Test).**

3. Number of vacancies (includes actual as well as anticipated vacancies on account of retirement/promotion etc. Vacancies are tentative and may increase or decrease):

S.No.	Post	UR	SC	ST	Total	PwBDs			
						OH	VI	HI	Others
1	Principal	64	--	--	64	--	--	--	--
2	Vice Principal	149	28	14	191	02	02	02	02
3	PGT English	36	06	03	45	01	01	--	--
4	PGT Hindi	46	08	04	58	--	01	01	01
5	PGT Maths	48	09	04	61	01	01	01	--
6	PGT Biology	46	08	04	58	--	01	01	01
7	PGT Chemistry	35	06	03	44	01	--	01	--
8	PGT Physics	53	09	04	66	01	--	01	01
9	PGT History	40	07	03	50	01	--	01	--
10	PGT Geography	40	07	03	50	01	01	--	--

Nature of disabilities for the post(s) in which horizontal reservation for PwBDs is earmarked:

Name of the post (s)	OH	VI	HI	Others
1	2	3	4	5
Vice Principal	OA, Dw, AAV, LC	LV	HH	Multiple disabilities mentioned in Col. 2 to 4
PGTs	OA, OL, AAV, Dw, LC	LV	HH	Multiple disabilities mentioned in Col. 2 to 4

Abbreviation used: OH=Orthopedically Handicapped, VI=Visually Impaired, HI= Hearing Impaired, HH=Hard of Hearing, LV=Low Vision, OA=One Arm, OL=One Leg, LC=Leprosy Cured, Dw=Dwarfism, AAV=Acid Attack Victims, MD=Multiple Disabilities, PwBDs=Persons with Benchmark Disabilities

Note: In accordance with the GOI, DoPT OM dated 17.05.2022 forwarded by Ministry of Education vide its letter dated 30.05.2022, reservation in promotion to PwBDs is ensured.

- (a) Persons with disability of 40% or more, if so desires, will have to bring their own scribe to assist them in the examination. The facility of Scribe will be allowed to any person with benchmark disability as defined under section 2 (r) of the RPwD Act, 2016 and has limitation in writing including that of speed if so desired by him / her. In case of persons with benchmark disabilities in the category of blindness, locomotor disability (both arm affected-BA) and cerebral palsy, the facility of scribe will be allowed, if so desired by the person. In case of other category of persons with benchmark disabilities, the provision of scribe will be allowed on production of a certificate to the effect that the person concerned has physical limitation to write, and scribe is essential to write examination on his behalf, from the Chief Medical Officer/Civil Surgeon/Medical Superintendent of a Government Health Care Institution as per proforma at **Annexure-I**. The qualification of the scribe should be at least one step below the qualification of the candidate taking the examination. The candidates with benchmark disabilities opting for own scribe shall be required to submit details of the own scribe at the time of examination as per proforma at **Annexure-II**. In

addition, the scribe has to produce a valid ID proof (PAN, Adhar Card, Driving Licence etc.) in original at the time of examination. A photocopy of the ID proof of the scribe signed by the candidate as well as the scribe will be submitted along with proforma at **Annexure-II**. If subsequently it is found that the qualification of the scribe is not as declared by the candidate, then the candidate shall forfeit his/ her right to the post and claims relating thereto.

- (b) Compensatory time to be allowed in PwD case is 20 minutes per hour of examination. All candidates with disability not availing the facility of scribe may be allowed additional time of minimum of one hour for examination of three hours duration. Reservation for person with disabilities in r/o the current year vacancies will be given as per the rules. No candidate will be permitted for the CBT without the proper Admit Card.

4. **Type of Examination:**

- 4.1 It is proposed to have a Computer Based Test (CBT) consisting of one paper of 150 marks with 2½ hours duration.
- 4.2 (i) Minimum Qualifying marks (for all posts except for the post of Principal):
- a) For UR Category - 45%
 - b) For SC/ST/PwBDs Category - 40%
- 4.2 (ii) Minimum Qualifying marks for the post of Principal (promotion to the post of Principal is from the post of Vice Principal i.e. from a Group A post to other Group A post and therefore reservation & concession is not applicable):- 45% marks
- 4.3 There will be negative marking for wrong answers; 1/4th marks will be deducted for each wrong answer.
- 4.4 For promotion to the post of **Principal**, candidates have to appear in CBT (LDCE) and attain the qualifying marks as stated in para 4.2 (ii). Such qualified candidates shall appear in a Personal Talk. Final Merit List will be prepared combining the marks in CBT (LDCE) and Personal Talk by giving weightage of 80% & 20% to marks secured in CBT (LDCE) and Personal Talk respectively. Promotion of candidates will be considered strictly as per merit to the extent of available vacancies and subject to possessing the prescribed benchmark in ACR/APAR of the preceding 5 years & other criteria /condition as per rule.
- 4.5 For promotion to the post of **Vice Principal**, candidates have to appear in CBT (LDCE). Promotion of those candidates who attain the qualifying marks as stated in para 4.2 (i) will be considered strictly as per merit to the extent of available vacancies under respective category and subject to possessing the prescribed benchmark in the preceding 05 years subject to service conditions & other criteria /condition as per rule.
- 4.6 LDE for promotion to the post of PGTs will be qualifying in nature. Promotion of those who qualify the CBT (LDE) will be considered as per their inter-se seniority and subject to availability of vacancies under respective category & subject and possessing minimum benchmark prescribed for promotion & other criteria / condition as per rule.

5. **SYLLABUS:**

The post wise details of syllabus for CBT are as under:

5.1 **PRINCIPAL:**

	Maximum marks=150
	Time: 2 ½ hours
(A) Reasoning & Numerical Ability	(10 marks)
(B) Language Competency (English: 10+Hindi:10)	(20 marks)
(C) General Awareness	(20 marks)
(D) Academics and Residential aspects	(50 marks)
(I) <u>Child Development and pedagogy:</u>	

- i) Child Development: Physical, intellectual and emotional & social development.
 - ii) Problems of Adolescence: Role of Home School, Hostel and society in dealing with them.
- (II) Learning:
- i) Concepts
 - ii) Factors affecting learning
 - iii) Motivation and measures for creating effective learning experience & competency based education.
 - iv) Learning outcomes
 - v) Pedagogical leadership
- (III) Perspective in Education:
- i) New Education Policy
 - ii) Government Acts and Policy on Children
 - iii) School system & organization
 - iv) Good governance in School System
- IV) Teaching Methodology and Class Room Management:
- i) Digital learning - various initiative by the Government, prospects, reach & effectiveness
 - ii) Curriculum
 - iii) Academic Planning and implementation
- V) Role & responsibility of Principals:
- i) Duties and responsibilities of Principal
 - ii) Creation, development and maintenance of facilities and assets in Vidyalaya
 - iii) Role of Principal in promoting academic excellence and co-scholastic activities
 - iv) Promotion of ethics and values in academic institutions
 - v) Responsibility of Principal related to admission in JNVs
- VI. NVS Scheme:
- i) Safety & security of inmates
 - ii) Mess Management
 - iii) Hostel Management
 - iv) Infrastructure and maintenance & repairs
 - v) Admission in JNVs
- (E) Administrative and Finance: (50 marks)
- (i) CCS (Conduct) Rules
 - (ii) CCS (CCA) Rules
 - (iii) FR/SR
 - (iv) CPF, NPS, Gratuity applicable to Samiti's employees
 - (v) CCS (Medical) Attendance Rules
 - (vi) TA/LTC Rules
 - (vii) Budgeting in NVS
 - (viii) PFMS/GeM
 - (ix) Income Tax
 - (x) Legal Framework
 - (xi) General Financial Rules 2017
 - (xii) Transfer Policy and guidelines of the Samiti
 - (xiii) Problem solving and decision making / leadership
 - (xiv) RTI Act 2005
 - (xv) NVS Purchase procedure
 - (xvi) NVS condemnation procedure
 - (xvii) Sexual Harassment at work place Act/Guidelines
 - (xviii) ICT knowledge
 - (xix) POCSO Act
 - (xx) Compassionate Appointment

- (A) Reasoning & Numerical Ability (10 marks)
- (B) Language Competency (English: 10 + Hindi:10) (20 marks)
- (C) General Awareness (20 marks)
- (D) Academics and Residential aspects (50 marks)
- (I) Child Development and pedagogy:
- i) Child Development: Physical, intellectual and emotional & social development.
 - ii) Problems of Adolescence: Role of Home School, Hostel and society in dealing with them.
- (II) Learning:
- i) Concepts
 - ii) Factors affecting learning
 - iii) Motivation and measures for creating effective learning experience & competency based education.
 - iv) Learning outcomes
 - v) Pedagogical leadership
- (III) Perspective in Education:
- i) New Education Policy
 - ii) Government Acts and Policy on Children
 - iii) School system & organization
 - iv) Good governance in School System
- (IV) Teaching Methodology and Class Room Management:
- i) Digital learning - various initiative by the Government, prospects, reach & effectiveness
 - ii) Curriculum
 - iii) Academic Planning and implementation
- (V) NVS Scheme:
- i) Safety & security of inmates
 - ii) Mess Management
 - iii) Hostel Management
 - iv) Infrastructure and maintenance & repairs
 - v) Admission in JNVs
- (E) Administrative and Finance: (50 marks)
- (i) CCS (Conduct) Rules
 - (ii) CCS (CCA) Rules
 - (iii) FR/SR
 - (iv) CPF, NPS, Gratuity applicable to Samiti's employees
 - (v) CCS (Medical) Attendance Rules
 - (vi) TA/LTC Rules
 - (vii) Budgeting in NVS
 - (viii) PFMS/GeM
 - (ix) Income Tax
 - (x) Legal Framework
 - (xi) General Financial Rules 2017
 - (xii) Transfer Policy and guidelines of the Samiti
 - (xiii) Problem solving and decision making / leadership
 - (xiv) RTI Act 2005
 - (xv) NVS Purchase procedure
 - (xvi) NVS condemnation procedure
 - (xvii) Sexual Harassment at work place Act/Guidelines
 - (xviii) ICT knowledge
 - (xix) POCSO Act
 - (xx) Compassionate Appointment
 - (xxi) Admission of students in JNVs.

5.3 POST GRADUATE TEACHERS:

Maximum marks=150

Time: 2 ½ hours

- (A) General Awareness (10 marks)
- (B) Language Competency (English-10 + Hindi-10) (20 marks)
- (C) Reasoning Ability (20 marks)
- (D) Knowledge of ICT (10 marks)
- (E) Domain Knowledge: (60 marks)
 - (i) Subject specific syllabus [Appended at Annexure-A] (Creative & critical thinking based questions),
 - (ii) Experiential activity based, pedagogy & case study based Question
 - (iii) National Education Policy 2020
 - (iv) NISTHA 2.0
- (F) NVS SCHEME: (30 marks)
 - (i) House System
 - (ii) Role & responsibilities of HM & AHM
 - (iii) Safety & Security of students in residential system-NVS guidelines on safety & security
 - (iv) Child Protection Laws to safe guard child rights with special emphasis on Protection of Children from sexual offences
 - (v) Purchase procedure as per NVS guidelines
 - (vi) Condemnation procedure as per NVS guidelines
 - (vii) JNVST
 - (viii) Transfer Policy & guidelines of the Samiti

6. GENERAL CONDITIONS

- (a) Medium of examination will be bilingual (Hindi and English)
- (b) A candidate who is or has been declared by the Samiti guilty of the following will be summarily rejected:-
 - i) Obtaining support for his candidature by any means or
 - ii) Impersonating, or
 - iii) Procuring impersonation by any person, or
 - iv) Submitting fabricated document or documents which have been tampered with, or
 - v) Making statements which are incorrect or false or as suppressing material information, or
 - vi) Resorting to any other irregular or improper means in connection with his/ her candidature for the examination, or
 - vii) Using unfair means during the examination, or
 - viii) Writing irrelevant matter, including obscene language or pornographic matter in the script(s) or
 - ix) Misbehaving in any other manner in the examination hall, or
 - x) Harassing or doing bodily harm to the staff employed by the Samiti or agency for the conduct of their examination, or
 - xi) Violating any of the instructions issued to candidates along with their Admission Certificates, permitting them to take the examination, or
 - xii) Attempts to commit or as the case may be abetting the Samiti of all or any of the acts specified in the foregoing clause; may, in addition to rendering himself liable to criminal prosecution, be liable:-
 - a) to be disqualified by the Samiti from the examination for which he/she is a candidate; and/ or
 - b) to be debarred either permanently or for a specified period:-
 - i) by the Samiti from any examination or selection held by them;
 - ii) by the Samiti, from any employment under them, and/or

- c) to disciplinary action under the opportunity of making such representation, in writing, as he may wish to make in that behalf, and provided that no penalty under this rule shall be imposed except after:-
- i) giving the candidate an opportunity of making such representation, in writing, as he may wish to make in that behalf, and
 - ii) taking the representation, if any submitted by the candidate within the period allowed to him, into consideration.
- xiii) Found ineligible in terms of prescribed requirements of experience of service and qualifications.

- (c) All eligible candidates are advised to be alert and regularly visit Samiti's website i.e. www.navodaya.gov.in for publication of separate intimation for conduct of **Computer Based Test (CBT)** and related information. It is further to intimate that communication for holding online CBT (LDCE/LDE) will be notified by Samiti in respect of aforesaid posts of Principal, Vice Principal & PGTs. However, tentative date (s) for i) inviting applications, ii) closing date for submitting application, iii) conduct of CBT (LDCE/LDE) & iv) centre for CBT (LDCE/LDE) are as under:

Registration of application on designated online portal	4 th July 2022
Registration closes	24 th July 2022
Date of conduct of CBT (LDCE/LDE)	Will be intimated on website of the Samiti in due course
Centre (s) for LDCE/LDE(CBT)	For the post of Principal: Delhi NCR only For rest of the post-it would be at Bhopal / Chandigarh / Bengaluru / Jaipur / Lucknow / Patna / Pune / Guwahati / Delhi NCR.

- (d) The candidate's response sheet and other related papers/documents of examination etc. in respect of this LDCE/LDE shall be kept as record only for six months from the date of CBT.

This issues with the approval of Competent Authority.



(Vikram Joshi)
Deputy Commissioner (Pers.)

Copy to:-

1. DC, NVS, All Regional Offices - with the request to circulate this notification amongst all the eligible candidates through Principal of all JNVs of your region and also upload the same on Regional office website for wider information.
2. DC, All the NLIs: with the request to take similar action.
3. DC (Admn), NVS HQ, NOIDA: for information.
3. AC (IT), NVS HQ, NOIDA. – with the request to place the notification on the website of the Samiti for information to all concerned.
4. Notice Board, NVS HQ, NOIDA.

Annexure-I

Certificate regarding physical limitation in an examinee to write

This is to certify that, I have examined Mr/Ms/Mrs _____ (name of the candidate with disability), a person with _____ (nature and percentage of disability as mentioned in the certificate of disability), S/o / D/o _____ a resident of _____ Village/District/State) and to state that he/she has physical limitation which hampers his/her writing capabilities owing to his/her disability.

Signature

Chief Medical Officer/Civil Surgeon/Medical Superintendent of a
Government health care institution

Name & Designation

Name of Government Hospital/Health Care Centre with Seal

Place:

Date:

Note: Certificate should be given by a specialist of the relevant stream/ disability (e.g. Visual impairment-Ophthalmologist, Locomotor disability- Orthopaedic specialist/ PMR)

Annexure-II

Letter of Undertaking for Using Own Scribe

I _____, a candidate with _____ (name of the disability) appearing for the _____ (name of the examination) bearing Roll No _____ at _____ (name of the centre) in the District _____, _____ (name of the State/ UT) My qualification is _____.

I do hereby state that _____ (name of the scribe) will provide the service of scribe for the undersigned for taking the aforesaid examination.

I do hereby undertake that his/ her qualification is _____. In case, subsequently it is found that his/ her qualification is not as declared by the undersigned and is beyond my qualification, I shall forfeit my right to the post and claims relating thereto.

(Signature of the candidate with Disability)

Place:

Date

SYLLABUS FOR WRITTEN EXAMINATION FOR PGT (ENGLISH)

Section A

READING COMPREHENSION

Ability to comprehend, analyze and interpret unseen texts.
Three/four unseen reading passages may be set.

Section B

WRITING ABILITY

Ability to express views/opinions in a coherent & logical manner.

B1. One out of two tasks such as factual description of any event or incident, a report or a process.

B2. Writing one formal letter. Letter types include

- a) Business or official letters (for making enquiries, registering complaints, asking for and giving information, placing orders and sending replies)
- b) Letter to the editors (giving facts/figures suggestions / opinions on an issue of public interest) on contemporary / current issues.
- c) Application for a job with cv.

B3. Writing personal opinion /views/stand in an article/debate/speech etc on a given socio - cultural issue -in a style/register suitable to the task set. Issues could relate to

- (a) environment
- (b) education
- (c) gender discrimination
- (d) economic disparity etc..

Section C

GRAMMAR AND USAGE

Ability to apply the knowledge of syntax and grammatical items & use them accurately in the context provided .

The following grammatical structures will be tested through error correction / editing/ gap filling / sentence completion / multiple choice questions :

1. Determiners
2. Tenses
3. Clauses
4. Modals
5. Voice

Section D

LITERATURE

- ✓ Shakespeare's works.
- ✓ Romantic period (e.g. Shelley, Wordsworth, Keats, Coleridge etc)
- ✓ 19th and 20th Century American and English Literature (e.g. Robert Frost, Hemmingway, Whitman, Hawthorne, Emily Dickinson , Bernard Shaw, Arthur Miller etc.)
- ✓ Modern Indian Writing in English (e.g. Anita Desai, Vikram Seth, Nissin Ezekiel, K N Daruwala, Ruskin Bond, R K Narayan, Mulk Raj Anand, Khushwant Singh etc)
- ✓ Modern writing in English from other parts of the world e.g. Latin America / Africa / Australia / South Asia.

[=====]

विषय – हिन्दी
खण्ड – क
इतिहास एवं साहित्य

हिन्दी साहित्य के इतिहास का विस्तृत अध्ययन

(i) आदिकाल से रीतिकाल

इसके अन्तर्गत कालगत परिस्थितियाँ एवं साहित्य पर उसका प्रभाव, प्रत्येक युग के साहित्य की प्रमुख प्रवृत्तियाँ, प्रमुख रचनाकार एवं उनकी रचनाएँ, साहित्यिक विशेषताएँ, भाषा – शैली

(क) आदिकाल – चंदबरदाई, अमीर खुसरो, विद्यापति

(ख) भक्तिकाल –

(1) निर्गुण भक्तिधारा – ज्ञानमार्गी शाखा, प्रेममार्गी शाखा – कबीर, दादू, रैदास, नानक, जायसी, कुतुबन। .

(2) सगुण भक्तिधारा – राम भक्तिशाखा, औष्ण-भक्ति शाखा – तुलसीदास, केशव, सूरदास, मीराबाई, अष्टछाप के कवि

(ग) रीतिकाल – रीतिबद्ध, रीतिसिद्ध, रीतिमुक्त काव्य
..... देव, घनानंद, बिहारी, मतिराम, सेनापति, भूषण, पद्माकर

(ii) आधुनिक काल

युगीन परिस्थितियाँ, साहित्यिक पृष्ठभूमि, मुख्य विचारधारा, मुख्य साहित्यकार, साहित्यिक रचनाएँ, विशेषताएँ, भाषा-शैली

(क) भारतेंदुयुग – भारतेंदु हरिश्चंद्र, बालमुकुन्दगुप्त, बदरीनारायण चौधरी 'प्रेमधन'

- (ख) द्विवेदीयुग – महावीर प्रसाद द्विवेदी, श्रीधर पाठक, अयोध्यासिंह उपाध्याय 'हरिऔध', मैथिलीशरणगुप्त
- (ग) छायावाद – जयशंकर प्रसाद, महादेवी वर्मा, सुमित्रानन्दन पंत, सूर्यकान्त त्रिपाठी निराला
- (घ) प्रगतिवाद – पंत, निराला, नरेन्द्र शर्मा, केदारनाथ अग्रवाल, नागार्जुन
- (ङ) प्रयोगवाद – मुक्तिबोध, नेमिचंद्र जैन, भारतभूषण अग्रवाल, प्रभाकर माचवे, गिरिजा कुमार माथुर, रामविलास शर्मा, 'अज्ञेय'
- (च) नई कविता – भवानी प्रसाद मिश्र, नरेन्द्र शर्मा, धूमिल, धर्मवीर भारती, शंभुनाथ सिंह

गद्य साहित्य का विस्तृत अध्ययन

गद्य एवं अन्य विधाओं का प्रारम्भ, विकास, प्रमुख प्रवृत्तियाँ, प्रमुख साहित्यकार, रचनाएँ, साहित्यिक विशेषताएँ, भाषाशैली।

निबंध, कथासाहित्य – उपन्यास और कहानी, नाटक, एकांकी, रेखाचित्र, संस्मरण, यात्रा-वृत्तांत, आत्मकथा, जीवनी, पत्र, डायरी, आलोचना, रिपोर्ताज आदि इन सभी विधाओं का विस्तृत परिचय।

2. हिंदी साहित्य

(काव्य साहित्य पर आधारित तीन प्रश्न)

निम्नलिखित कवियों की प्रसिद्ध काव्य-रचनाओं में से लिए गए काव्यांशों पर आधारित सप्रसंग व्याख्या, भाव-सौंदर्य, शिल्प सौंदर्य पर एक वस्तु निष्ठ प्रश्न एवं दो विषय परक प्रश्न –

(i) सप्रसंग व्याख्या, भाव सौंदर्य – विषय परक-प्रश्न

(ii) शिल्प सौन्दर्य – वस्तुनिष्ठ प्रश्न

अमीर खुसरो, विद्यापति, सूरदास, तुलसीदास, कबीरदास, जायसी, मीराबाई, रसखान, धनानंद, बिहारीलाल, भारतेन्दु, मैथलीशरण गुप्त, दिनकर, जयशंकर प्रसाद, महादेवी वर्मा, निराला, पंत, हरिवंशराय बच्चन, मुक्तिबोध, रघुवीर सहाय, केदारनाथ सिंह, भवानीप्रसाद मिश्र, 'अज्ञेय' इत्यादि (संकेत – एम. ए. तक के पाठ्यक्रम में पढ़ी उपरोक्त कवियों की प्रसिद्ध कविताएँ)

निम्नलिखित गद्य – लेखकों की प्रसिद्ध रचनाओं में से व्याख्या से संबंधित अंश, आशय स्पष्टीकरण एवं भाषा – शैली पर आधारित प्रश्न

(i) सप्रसंग व्याख्या एवं आशय स्पष्टीकरण पर आधारित दो विषय परक प्रश्न

(ii) भाषा – शैली पर आधारित

भारतेन्दु, रामचंद्र शुक्ल, प्रेमचंद, जैनेन्द्र कुमार, हजारीप्रसाद द्विवेदी, धर्मवीर भारती, रामविलास शर्मा, निर्मल वर्मा, फणीश्वर नाथ 'रेणु', कृष्णा सोबती, भीष्म साहनी, शेखर जोशी, विष्णु खरे, ममता कालिया

3. कवियों और लेखकों के व्यक्तित्व एवं औचित्य पर आधारित एक प्रश्न जिसके पाँच भाग होंगे – यह प्रश्न हिन्दी साहित्य के प्रसिद्ध कवियों एवं लेखकों के जीवन-परिचय, साहित्यिक रचनाएँ एवं भाषा – शैली पर आधारित होंगे।

खण्ड – ख
व्याकरण एवं रचना

व्याकरण

(क) शब्द—विचार एवं शब्द भंडार

शब्द भेद — अर्थ, रचना, स्रोत तथा प्रयोग की दृष्टि से शब्द
भंडार—पर्यायवाची, विपरीतार्थक, एकार्थी, अनेकार्थी

शब्द—युग्म

शब्द निर्माण — उपसर्ग, प्रत्यय, समास

(ख) पद—विचार, पदबंध, पद—परिचय

संज्ञा, सर्वनाम, विशेषण, क्रिया, क्रिया विशेषण

पदबंध—भेद, प्रयोग

पद—परिचय

(ग) वाक्य—विचार

वाक्य संरचना

वाक्य भेद — अर्थ एवं रचना की दृष्टि से

वाक्य—परिवर्तन

वाक्य—संश्लेषण, वाक्य — विश्लेषण

(घ) सन्धि

स्वर सन्धि, व्यंजन सन्धि, विसर्ग सन्धि

2. अपठित बोध —

(क) काव्यांश पर आधारित प्रश्न, भाव सौन्दर्य, शिल्प — सौन्दर्य

(ख) गद्यांश (साहित्यिक / वर्णनात्मक)

3. (i) समसामयिक विषय
(ii) वर्णनात्मक विषय
(iii) सर्जनात्मक विषय
(iv) साहित्यिक विषय
4. काव्यशास्त्रीय अध्ययन
(i) साहित्य का अर्थ, स्वरूप, उद्देश्य
(ii) साहित्य की विविध विधाएँ
(iii) रस-मीमांसा – सभी रसों का ज्ञान, काव्य की आत्मा के रूप में रस मीमांसा
(iv) शब्द शक्ति – अभिधा, लक्षणा, व्यंजना
(v) काव्य-गुण – प्रसाद, माधुर्य, ओज
(vi) काव्य-दोष – विस्तृत जानकारी
(vii) छंद ज्ञान – वर्णिक, मात्रिक
(viii) अलंकार – शब्दालंकार, अर्थालंकार, उभयालंकार एवं नए अलंकार

खण्ड – ग

लेखन कौशल और पत्रकारिता

पत्रकारिता से संबंधित विषय

- (i) प्रिंट माध्यम (समाचार और संपादकीय)
- (ii) रिपोर्ट
- (iii) आलेख
- (iv) फीचर लेखन
- (v) साक्षात्कार
- (vi) रेडियो व दूरदर्शन के लिए लेखन?
- (vii) विज्ञापन लेखन

- (viii) उद् घोषणा
- (ix) स्वागत भाषण
- (x) संगोष्ठी संचालन
2. व्यावहारिक लेखन पर एक विषयपरक प्रश्न
- (i) व्यावहारिक हिन्दी का स्वरूप
- (ii) प्रयोजनमूलक हिन्दी और उसके विविध आयाम
- (iii) कार्यालयी हिन्दी और उसके विविध आयाम
- (iv) प्रतिवेदन, अर्थ, प्रमुख तत्व, विशेषताएँ, प्रकार प्रतिवेदन लेखन
- (v) कार्यसूची – कार्यसूची तैयार करने का नमूना
- (vi) कार्यवृत्ता – स्वरूप, निर्माण
3. सर्जनात्मक लेखन एवं मौलिक अभिव्यक्ति पर एक विषयपरक प्रश्न
कविता, कहानी, लघुकथा, डायरी लेखन आदि के रूप में –
- (i) दिए गए विषय पर – कविता, लघुकथा संबंधी मौलिक रचना
- (ii) कहानी का कविता में रूपान्तरण
- (iii) अनुभवों के आधार पर लेखन
4. विभिन्न दक्षताओं के विकास हेतु एक विषयपरक प्रश्न
- (i) वार्तालाप की दक्षता के विकास हेतु संवाद लेखन।
- (ii) कोई भी समसामयिक विषय द्वारा कहानी / कविता लेखन।

Syllabus for written examination for PGT(Mathematics)

Sets :

Sets and their representations. Empty set. Finite & Infinite sets. Equal sets. Subsets. Subsets of the set of real numbers. Power set. Universal set. Venn diagrams. Union and Intersection of sets. Difference of sets. Complement of a set.

Relations & Functions:

Ordered pairs, Cartesian product of sets. Number of elements in the cartesian product of two finite sets. Cartesian product of the reals with itself (upto $R \times R \times R$). Definition of relation, pictorial diagrams, domain, co-domain and range of a relation. Function as a special kind of relation from one set to another. Pictorial representation a function, domain, co-domain & range of a function. Real valued function of the real variable, domain and range of these functions, constant, identity, polynomial, rational, modulus, signum and greatest integer functions with their graphs. Sum, difference, product and quotients of functions. Sets and their Representations. Union, intersection and complements of sets, and their algebraic properties, Relations, equivalence relations, mappings, one-one, into and onto mappings, composition of mappings.

Principle of Mathematical Induction:

Processes of the proof by induction. The principle of mathematical induction.

Permutations & Combinations:

Fundamental principle of counting. Factorial n . Permutations and combinations, derivation of formulae and their connections, simple applications.

Complex Numbers:

Complex numbers, Algebraic properties of complex numbers, Argand plane and polar representation of complex numbers, Statement of Fundamental Theorem of Algebra, solution of quadratic equations in the complex number system. Modulus and Argument of a complex number, square root of a complex number. Cube roots of unity, triangle inequality.

Linear Inequalities:

Linear inequalities. Algebraic solutions of linear inequalities in one variable and their representation on the number line. Graphical solution of linear inequalities in two variables. Solution of system of linear inequalities in two variables- graphically. Absolute value, Inequality of means, Cauchy-Schwarz Inequality, Tchebychef's Inequality.

Binomial Theorem:

Statement and proof of the binomial theorem for positive integral indices. Pascal's triangle, general and middle term in binomial expansion, simple applications. Binomial Theorem for any index. Properties of Binomial Co-efficients. Simple applications for approximations.

Sequence and Series:

Sequence and Series. Arithmetic, Geometric and Harmonic progressions (G.P.), General terms and sum to n terms of A.P., G.P. and H.P. Arithmetic Mean (A.M.), Geometric Mean (G.M.), and Harmonic Mean (H.M.), Relation between A.M., G.M. and H.M. Insertion of Arithmetic, Geometric and Harmonic means between two given numbers. Special series, Sum to n terms of the special series. . Arithmetico-Geometric Series, Exponential and Logarithmic series.

Elementary Number Theory:

Peano's Axioms, Principle of Induction; First Principle, Second Principle, Third Principle, Basis Representation Theorem, Greatest Integer Function Test of Divisibility, Euclid's algorithm, The Unique Factorisation Theorem, Congruence, Sum of divisors of a number . Euler's totient function, Theorems of Fermat and Wilson.

Quadratic Equations:

Quadratic equations in real and complex number system and their solutions. Relation between roots and co-efficients, nature of roots, formation of quadratic equations with given roots; Symmetric functions of roots, equations reducible to quadratic equations – application to practical problems.

Polynomial functions, Remainder & Factor Theorems and their converse, Relation between roots and coefficients, Symmetric functions of the roots of an equation. Common roots.

Matrices and Determinants:

Determinants and matrices of order two and three, properties of determinants, Evaluation of determinants. Area of triangles using determinants, Addition and multiplication of matrices, adjoint and inverse of matrix. Test of consistency and solution of simultaneous linear equations using determinants and matrices.

Two dimensional Geometry:

Cartesian system of rectangular co-ordinates in a plane, distance formula, section formula, area of a triangle, condition for the collinearity of three points, centroid and in-centre of a triangle, locus and its equation, translation of axes, slope of a line, parallel and perpendicular lines, intercepts of a line on the coordinate axes.

Various forms of equations of a line, intersection of lines, angles between two lines, conditions for concurrence of three lines, distance of a point from a line, Equations of internal and external bisectors of angles between two lines, coordinates of centroid, orthocentre and circumcentre of a triangle, equation of family of lines passing through the point of intersection

of two lines, homogeneous equation of second degree in x and y , angle between pair of lines through the origin, combined equation of the bisectors of the angles between a pair of lines, condition for the general second degree equation to represent a pair of lines, point of intersection and angle between two lines.

Standard form of equation of a circle, general form of the equation of a circle, its radius and centre, equation of a circle in the parametric form, equation of a circle when the end points of a diameter are given, points of intersection of a line and a circle with the centre at the origin and condition for a line to be tangent to the circle, length of the tangent, equation of the tangent, equation of a family of circles through the intersection of two circles, condition for two intersecting circles to be orthogonal.

Sections of cones, equations of conic sections (parabola, ellipse and hyperbola) in standard forms, condition for $y = mx + c$ to be a tangent and point(s) of tangency.

Trigonometric Functions:

Positive and negative angles. Measuring angles in radians & in degrees and conversion from one measure to another. Definition of trigonometric functions with the help of unit circle. Graphs of trigonometric functions. Expressing $\sin(x+y)$ and $\cos(x+y)$ in terms of $\sin x$, $\sin y$, $\cos x$ & $\cos y$. Identities related to $\sin 2x$, $\cos 2x$, $\tan 2x$, $\sin 3x$, $\cos 3x$ and $\tan 3x$. Solution of trigonometric equations, Proofs and simple applications of sine and cosine formulae. Solution of triangles. Heights and Distances.

Inverse Trigonometric Functions:

Definition, range, domain, principal value branches. Graphs of inverse trigonometric functions. Elementary properties of inverse trigonometric functions.

Differential Calculus:

Polynomials, rational, trigonometric, logarithmic and exponential functions, Inverse functions. Graphs of simple functions. Limits, Continuity and differentiability; Derivative, Geometrical interpretation of the derivative, Derivative of sum, difference, product and quotient of functions. Derivatives of polynomial and trigonometric functions, Derivative of composite functions; chain rule, derivatives of inverse trigonometric functions, derivative of implicit function. Exponential and logarithmic functions and their derivatives. Logarithmic differentiation. Derivative of functions expressed in parametric forms. Second order derivatives. Rolle's and Lagrange's Mean Value Theorems and their geometric interpretations.

Applications of Derivatives:

Applications of derivatives: rate of change, increasing / decreasing functions, tangents & normals, approximation, maxima and minima.

Integral Calculus:

Integral as an anti-derivative. Fundamental integrals involving algebraic, trigonometric, exponential and logarithmic functions. Integration by substitution, by parts and by partial fractions. Integration using trigonometric identities. Definite integrals as a limit of a sum, Fundamental Theorem of Calculus. Basic Properties of definite integrals and evaluation of definite integrals; Applications of definite integrals in finding the area under simple curves, especially lines, areas of circles / Parabolas / ellipses, area between the two curves.

Differential Equations:

Definition, order and degree, general and particular solutions of a differential equation. Formation of differential equation whose general solution is given. Solution of differential equations by method of separation of variables, homogeneous differential equations of first order and first degree. Solutions of linear differential equation.

Vectors:

Vectors and scalars, magnitude and direction of a vector. Direction cosines / ratios of vectors. Types of vectors (equal, unit, zero, parallel and collinear vectors), position vector of a point, negative of a vector, components of a vector, addition of vectors, multiplication of a vector by a scalar, position vector of a point dividing a line segment in a given ratio. Scalar (dot) product of vectors, projection of a vector on a line. Vector (cross) product of vectors.

Three dimensional Geometry:

Coordinates of a point in space, distance between two points; Section formula, Direction cosines / ratios of a line joining two points. Cartesian and vector equation of a line, coplanar and skew lines, shortest distance between two lines. Cartesian and vector equation of a plane. Angle between (i) two lines, (ii) two planes. (iii) a line and a plane. Distance of a point from a plane. Scalar and vector triple product. Application of vectors to plane geometry. Equation of a sphere, its centre and radius. Diameter form of the equation of a sphere.

Statistics:

Calculation of Mean, median and mode of grouped and ungrouped data. Measures of dispersion; mean deviation, variance and standard deviation of ungrouped / grouped data. Analysis of frequency distributions with equal means but different variances.

Probability:

Random experiments: outcomes, sample spaces. Events: occurrence of events, exhaustive events, mutually exclusive events, Probability of an event, probability of 'not', 'and' & 'or' events., Multiplication theorem on probability. Conditional probability, independent events,,

Baye's theorem, Random variable and its probability distribution, Binomial and Poisson distributions and their properties.

Linear Algebra

Examples of vector spaces, vector spaces and subspace, independence in vector spaces, existence of a Basis, the row and column spaces of a matrix, sum and intersection of subspaces. Linear Transformations and Matrices, Kernel, Image, and Isomorphism, change of bases, Similarity, Rank and Nullity. Inner Product spaces, orthonormal sets and the Gram-Schmidt Process, the Method of Least Squares. Basic theory of Eigenvectors and Eigenvalues, algebraic and geometric multiplicity of eigen value, diagonalization of matrices, application to system of linear differential equations. Generalized Inverses of matrices, Moore-Penrose generalized inverse.

Real quadratic forms, reduction and classification of quadratic forms, index and signature, triangular reduction of a pair of forms, singular value decomposition, extrema of quadratic forms. Jordan canonical form, vector and matrix decomposition.

Analysis

Monotone functions and functions of bounded variation. Real valued functions, continuous functions, Absolute continuity of functions, standard properties. Uniform continuity, sequence of functions, uniform convergence, power series and radius of convergence. Riemann-Stieltjes integration, standard properties, multiple integrals and their evaluation by repeated integration, change of variable in multiple integration. Uniform convergence in improper integrals, differentiation under the sign of integral - Leibnitz rule.

Dirichlet integral, Liouville's extension. Introduction to n-dimensional Euclidean space, open and closed intervals (rectangles), compact sets, Bolzano-Weierstrass theorem, Heine-Borel theorem. Maxima-minima of functions of several variables, constrained maxima-minima of functions. Analytic function, Cauchy-Riemann equations, singularities, Statement of Cauchy theorem and of Cauchy integral formula with applications, Residue and contour integration. Fourier and Laplace transforms, Mellin's inversion theorem.

Syllabus for written examination for PGT (Biology)

Diversity of living world

Taxonomic aids, keys, specimen management ; Systematic and binomial system of nomenclature; Classification of living organisms(five kingdom classification, major groups and principles of classification within each group) ; General description of monera, protozoa, fungi, algae, bryophytes, pteridophytes, gymnosperms, angiosperms (major groups of angiosperms upto sub class) ; Botanical gardens ,herbaria, zoological parks and museums .Salient features of animal (nonchordates up to phylum level and chordates up to class level).

Structural organisation in plants and animals

Morphology, Anatomy and histology of angiosperms: Root , stem , leaf, flower , inflorescence, fruits and seeds, Tissues : Meristamatic and permanent (epidermal, ground, vascular). Cambial activity, secondary growth, type of wood. Animal tissues ; Morphology, Anatomy and histology of annelids , insects , amphibians.

Structural and functional organization of cell

Cell cycle , detailed study of Cell division (mitosis , meiosis) ; Cell death ; Structure and function(metabolism) of carbohydrates, proteins, lipids and nucleic acids ; Enzymology : Classification and nomenclature of enzymes ; Structure ; Mechanism of action, single substrate and bisubstrate enzyme ; Activators and inhibitors of enzymes ; Factors affecting the activity of enzymes.

Plant physiology

Water relations: Properties of water, water in tissues and cells, Transport of water and solutes(food, nutrients, gases) : Transport across cell membrane ; soil-plant-atmosphere continuum ; Minerals required by plant, their absorbable form, functions, deficiency symptoms, essentiality of mineral, N_2 metabolism, biological fixation ; Cellular Metabolism: Gluconeogenesis, Glycogenesis and glycogenolysis, hormonal regulation ; Oxidation of food, respiratory efficiency of various food components ; transport and detoxification of ammonia , Lipid Metabolism ; Photosynthesis: Basic principles of light absorption, excitation energy transfer, electron transports, cycles (C_2 , C_3 , C_4 , CAM), plant productivity, measurement of photosynthetic parameters ; Physiological responses to abiotic stresses ; Sensory photobiology ; Plant growth regulators : Growth ,differentiation / de-differentiation and re-differentiation, development ; Physiological affects and mechanism of action of plant growth hormones, Flowering : Photoperiodism and its significance, endogenous clock and its regulation, floral induction and development, vernalisation ; Plant movements.

Human biology

Morphology, Anatomy, Histology, Physiology, Control and Disorders of Digestion, Respiration, Body fluids and Circulation, Excretion, Skeleton system & muscle, Nervous; Physiology of high altitude.

Sexual Reproduction

Plants: Structural details of angiospermic flower, development of gametophytes, pollination and its types, agencies of pollination, pollen- pistil interaction, fertilization, Artificial hybridization (emasculation and bagging) development of seed and fruit ; Apomixis and Polyembryony ; Self incompatibility: Structural and biochemical aspects; methods to overcome incompatibility; Experimental Embryology; Human Reproduction: Morphology, Anatomy, Histology and Physiology of reproduction ; Neuro-endocrine control ; Sexual behavior in infancy, pre-adolescence, adolescence and of adult ; Implantation, Pregnancy and Parturition ; Mammary gland and Lactation ; Infantile mammary gland, pubertal changes in mammary gland; Structure of adult mammary gland, galactopoiesis, milk let down ; Menopause. Senescence – Impact of age on reproduction.Foetal and Embryonic Gonads and Genital ducts ;Hormonal basis of sex differentiation ; Disorders of sexual differentiation development ;Reproductive Health: Problems and strategies, Population explosion –causes and effects, birth control measures- natural methods, physical / barrier, bio-chemical, hormonal, immunological, surgical methods, IUD's , amniocentesis, female feticide, MMR, IMR, MTP, STD's, infertility Disorders of female and female reproductive systems – Sexual dysfunction; Infertility – Causes and curative measures ; Reproductive toxicology of environmental and industrial chemicals, drug and alcohol ;Medically assisted human reproductive technologies, GIFT, IUT, ZIFT, TET ; Embryo culture.

Genetics

Principles of Inheritance and Variation: Mendelian genetics, Inheritance of one gene, two genes, post mendelian inheritance; Recombination frequency, chromosomal theory of inheritance ; Drosophila genetics, linkage and recombinations ; Mutation :General properties of mutations ; Adaptation versus mutation ; molecular basis of gene mutation : DNA repair mechanisms ; Pedigree analysis ; Human karyotype-banding ; genetic and environmental basis of sex determination, Y- and X-linked genes; Numerical and Structural abnormalities of human chromosomes and related syndromes ; Human metabolic disorders.;Molecular Basis of Inheritance: Chemical nature of DNA and RNA, Biological functions of nucleic acids ; Search for genetic material, RNA world ; Replication ; Transcription and processing of RNA, Genetic code ; Translation, post-translational modifications ; Ribosomes and Proteins ; Regulation of Gene

expression ; DNA Fingerprinting ; Gene mapping ; Chromosome banding; Restriction enzyme, nucleotide sequence comparisons and homologies ; Molecular clocks ; Genetics in modern agriculture ,animal breeding, medicine, human behaviour ; Misuse of genetics ; Genetic Counseling ; Gene therapy ; HGP ; Gene Activity in prokaryotes and eukaryotes ; Signals for gene control – Hormones and growth factors ; Totipotency & Pluripotency ; Stem cell and Gene therapy ; Bacterial transformation, transduction and conjugation, Bacterial chromosome ; Bacteriophages : Types, structure and morphology ;Evolutionary biology: Cosmic evolution – Physical basis of life ; Theories of origin of life ; Origin of life through biochemical evolution ; Experimental evidences for origin of life ; The origin of natural selection ; Extraterrestrial life ; Evolution of the eukaryotic cell : Evolution of the Metazoa ; Evolution of chordata and the evolution of the major vertebrate classes; Origin and evolution of man : Population Genetics; Genetic variations ; Polymorphism ; Gene frequency; Hardy Weinberg equilibrium ; Genetic drift, founder effect ; adaptive radiations, ecological significance of molecular variations.

Biology in Human welfare

Health and disease ; types of diseases, common diseases in humans ; Immunology – Innate and Acquired immunity ; Passive and active immunization ; Organization and structure of lymphoid organ ; Cells of the immune system and their differentiation ; Lymphocyte traffic ; Nature of immune response ; Structure and Functions of antibodies : Antigen-Antibody interactions ; Humoral immune response ; Cell mediated immunity ; Immunological memory ; Auto-immunity ; Allergies; HLA system in human :MHC haplotypes ; Transplantation types and problems ; Immunodeficiency disorders ;etiology of HIV ; types, genetics and biochemistry of cancer ; Drugs and alcohol abuse, Addiction , drug dependence, ill effects, prevention, its abuse in adolescents and its management;Strategies for food production and enhancement: Animal husbandry, management of farm animals, breeding strategies (natural and artificial) and their types, economic importance of each ; Plant breeding, method of release of new variety, HYV of common cereals and pulses, bio-fortification, SCP ; Tissue culturing, somatic hybridization;Microbes in Human Welfare: Technology associated and use of Microbes in household, industries, medicine, bio-active molecules, sewage treatment and STP, Ganga and Yamuna action plan, biogas production, biocontrol agents, biofertilizers.

Principles of Biotechnology

Genetic engineering tools and technique, technique of separation and isolation of DNA, cloning vectors ,electrophoresis, bio reactors, processing of its products. Tissue engineering ; Cryopreservation ; Fusion methods, detection and applications of monoclonal antibodies, DNA vaccines, Edible vaccines.;Application in agriculture : GMO for pest resistance, RNAi and dsRNA technology,Application in Medicine, genetically engineered products, gene therapy. Molecular diagnosis : serum and urine analysis, PCR, ELISA ; Transgenic animals : their physiology, biological products and their use for testing the safety of vaccine and chemicals ; Bioethics issues ; biopyracy.

Ecology

Organism and its environment, distribution of biomes, major physical factors and the physiological responses shown by organisms ; Physical adaptation of plants and animals, rules governing adaptations ; Population attributes and growth, logistic curves, Darwinian fitness ; Population interactions and their theories ; Ecosystem structure and functions, ecosystem productivity and standing crop, decomposition in nature, energy flow in GFC / DFC, ecological pyramids, succession of community ; Nutrient cycle ; ecosystem services ; Biodiversity types and its patterns, importance of diversity, its loss and their causes, conservation strategies ; Environmental issues : Types of pollution, their indicators, causes, effects, prevention and treatment ; Deforestation, recommended forestation, reforestation, case studies of people's participation in conservation.

Syllabus for written examination for PGT(CHEMISTRY)

S.No.	Topic (Details of the syllabus)
1.	Some Basic concepts of Chemistry: Scope of chemistry- Historical approach to nature of matter - states of matter, properties of matter and its measurement, S. I system of units, Uncertainty in measurements, dimensional analysis, Laws of chemical combination, atomic and molecular masses, Mole concept and molar masses, percentage composition, empirical and molecular masses, equivalent weight, concept of limiting reagent
2	States of Matter: Gases, liquids and solids, three states of matter, types of intermolecular forces. The laws governing ideal gas behaviour, Dalton's law of partial pressure, Kinetic molecular theory of ideal gases, Maxwell Boltzmann distribution law on molecular motion, real gases - deviation from ideal behaviour, vander Waals equation. <i>Liquid</i> and their properties. <i>Solids:</i> Classification of solids, fundamental types of lattices, two and three dimensional lattice types, Simple crystal structures, Transformation of crystal structure on varying temperature, Bragg's law, density in solids, energy band, band gaps, semiconductors, magnetic and dielectric properties, stoichiometric and non- stoichiometric defects in solids.
3	Structure of Atom: <i>Structure of Atom (Classical Theory)</i> , Dalton's atomic theory, Bohr's model of atom, <i>Structure of atom (modern theory)</i> , de Broglie's relationship, Heisenberg's uncertainty principle, Classical wave equation, Schrödinger's wave equation, Probability distribution curve, Quantum numbers, Pauli's exclusion principle, Aufbau principle, Hund's rule of maximum multiplicity.
4	Equilibrium: Reversible reactions, criteria of equilibrium, Law of mass action, equilibrium constant, K_c and K_p , Le Chatelier principle, Ionic equilibrium, Ostwald's dilution Law, solution of acids, bases, ionic equilibria in solution, Common ion effect - its application to qualitative analysis, acids and bases, Bronsted- Lowry theory of acids and bases, Lewis concept of acid and bases, relative strengths of acids and bases, their quantitative estimation, buffer solution and its use, determination of pH, theories of indicators, conductometric titration, Solubility product, hydrolysis.
5.	Surface Chemistry: Adsorption, absorption, sorption, Physical adsorption, Chemisorption adsorption, isotherms (Freundlich, Langmuir), application of adsorption, types of Catalysis theories of catalysis, classification of colloids, preparation of Colloidal Solution (lyophobic and lyophilic), Special characteristics of colloidal solutions, electrophoresis, Precipitation of colloids - Hardy Schulze law, multimolecular and macromolecular colloids, Emulsion and Gels.
6	Chemical Kinetics: Theories of reaction rates, rate of reaction, molecularity and order of reaction, Fast reactions- Luminescence and energy transfer process, reaction mechanisms (Simple and complex reactions).
7	Redox Reaction and Electrochemistry: Oxidation and reduction, redox reaction and its application, oxidation number, Strong and weak electrolytes, activity coefficient, conductance and conductivity, Kohlrausch law, resistance and resistivity molar conductivity, equivalent conductivity, Qualitative and quantitative aspect of electrolysis, electrochemical cell and electrolytic cell, Electrode and electrode potential and standard electrode potential, Electrochemical series and its applications, Nernst equation and its application, Equilibrium constant and EMF of the cell.
8	Solutions: Solution and its types, expression of concentration of solution, solubility and factors affecting the solubility of a solid in a liquid (temperature and pressure), Vapour pressure of a liquid, Raoult's law for both volatile and non volatile solute, Ideal and non ideal solution, Colligative properties, abnormal molecular masses and Van't Hoff factor.
9	Chemical bonding and Molecular Structure: Valence electrons and Lewis structures, Ionic bond, Covalent bond, Bond parameters, Co-ordinate bond, polarity and dipole moment, Quantitative idea of - valence bond theory, molecular orbital theory (LCAO), Concept of hybridization involving s, p, d orbitals, Hydrogen bond, Resonance.
10.	Thermodynamics: Macroscopic properties of the system, modes of transfer of energy between system and surrounding, Phase transition, phase rule and phase diagram, First Law, second law and third law, of thermodynamics. Internal energy and enthalpy of the reaction, their measurement and application, spontaneity of process, Entropy and spontaneity, Helmholtz and Gibb's free energy, Thermodynamics of electrochemical cells.
11.	Classification of elements and periodicity in properties: Significance of classification, brief history of the development of periodic table, periodic laws, name of the elements with $Z > 100$ according to IUPAC system, classification of elements into s, p, d, f -block elements and their characteristics, Periodic trends in the properties of elements - Ionization enthalpy, Electron gain enthalpy, electronegativity, atomic radii, ionic radii, periodicity of valency or oxidation state.
12.	Hydrogen: Position of Hydrogen in periodic table, occurrence, isotopes, Preparation of hydrogen, on small and commercial scale, hydrides, water, hard and soft water, heavy water, hydrogen peroxide, hydrogen economy, hydrogen as a fuel.
13.	General principles and processes of isolation of elements and s - block elements: Principles and methods of extraction, oxidation and reduction as applied to the extraction procedures of Al, Cu, Zn and Fe. s - block elements, general introduction - Electronic configuration, occurrence, Anomalous properties of the first element of each group, diagonal relationship,

	Trends in variation of the properties, reaction of alkali and alkaline earth metals. Preparation and properties and uses of some important compounds: - sodium carbonate, sodium bicarbonate, sodium chloride, sodium hydroxide, calcium hydroxide and calcium carbonate, industrial uses of lime and lime stone, biological importance of sodium, potassium, magnesium and calcium.
14.	p – Block Elements: Electronic configuration, variation in physical and chemical properties of groups 13 to 18, physical and chemical properties of borax, boric acid, boron hydride, silicones, preparation and uses, preparation, properties and uses of nitrogen, ammonia, nitric acid and oxides of nitrogen, phosphorus – allotropic forms, preparation and properties of phosphine, phosphorus pentachloride and phosphorus trichloride, preparation, properties and uses of oxygen and ozone, hydrides and halides of 16 group elements, their structure and nature, allotropic forms of sulphur- their preparation, preparation, properties and uses of sulphur dioxide, industrial preparation of oxo-acids of sulphur, preparation and properties of halogen and halogen acids, inter halogen compounds, pseudohalide ions. Oxo-acids of halogens, their structure and nature, preparation, properties and uses of xenon fluorides, oxides of xenon and xenon oxo fluorides.
15.	The d – and f- Block Elements: General introduction, electronic configuration and general trend in the properties of first row transition metals like metallic character, ionization enthalpy, oxidation states, ionic radii, coloured ion formation, catalytic properties, magnetic properties, oxides, halides and sulphides of first row transition metals, complex compound formation etc. Preparation, properties and structures of KMnO_4 and $\text{K}_2\text{Cr}_2\text{O}_7$, lanthanoids and actinoids.
16.	Co-ordination Compounds and organometallics: Meaning of co-ordination compounds, Werner's theory, ligands – their types, IUPAC nomenclature of co- ordination compounds, isomerism, bonding in co-ordination compounds, colour, magnetic properties and, stabilities of co-ordination compounds. Chemical and biological importance of co-ordination compounds, metal carbonyls: preparation, properties and bonding, organometallic compounds and their classification.
17.	Organic Chemistry : Some Basic Principles and Techniques: General Classification of organic compounds, Shapes of organic compounds-Hybridisation(sp , sp^2 , sp^3), Structural representation of organic molecules, Functional groups, Homologous, series. Common or trivial names, nomenclature of aliphatic, aromatic and substituted aromatic compounds. Isomerism : Structural and Stereo isomerism Fundamental Concepts in Reaction Mechanism: Cleavage of covalent bond, Types of attacking species, electron movement in organic reactions, electronic displacement in a covalent bond and types of organic reactions. Methods of purification of organic compounds: Qualitative analysis, Quantitative analysis, estimation of the elements and determination of empirical and molecular formula.
18.	Hydrocarbons: Classification of hydrocarbons. Alkanes: Conformations (Newmann and Sawhorse formulae), Physical properties, Chemical reactions Cycloalkanes: Preparation, physical and chemical properties, stability of cycloalkanes(Bayer strain theory), chair and boat forms of cyclohexane. Alkenes; structure of double bond, geometrical isomerism, physical properties, methods of preparation, chemical reactions. Alkadienes: Classification of dienes, Preparation of conjugated dienes, Chemical properties(1,2 and 1,4- addition to conjugated dienes). Alkynes; structure of triple bond, physical properties, methods of preparation Chemical properties, Acidic nature of alkynes Aromatic Hydrocarbons: , Structure of benzene, resonance, aromaticity (Huckel's rule) Chemical properties, mechanism of electrophilic substitution direct influence of substituents in monosubstituted benzene.
19.	Environmental Chemistry: Environmental pollution, Atmospheric pollution, Tropospheric pollution(Air pollution), Major air pollutants, Control of air pollution, Smog(Chemical and Photochemical smog), Stratospheric pollution: Ozone layer and its depletion, Acid rain, Green House Effect and Global warming, Water pollution, Soil pollution and Industrial waste.
20.	Haloalkanes and Haloarenes: Classification, methods of preparation of haloalkanes and haloarenes, their physical properties, tests to distinguish between alkyl and aryl halides, mechanism of SN^1 and SN^2 reactions , elimination reactions (Saytzeff Rule, E_1 & E_2 mechanism). Poly halogen compounds: Preparation and properties.
21.	Alcohols, Phenols and Ethers: Classification, preparation, properties and uses, tests to distinguish between primary, secondary and tertiary alcohols. Distinctions between alcohols and phenols. Preparation of ethers , physical and chemical properties.
22.	Aldehydes, Ketones and Carboxylic Acids: Structure of carbonyl group, preparation of aldehydes and ketones, physical , Chemical properties and uses, tests to distinguish between aldehydes and ketones .Preparations of carboxylic acids preparation properties and uses.

23.	<p>Amines (Organic compounds containing nitrogen): Classification, Structure of amino group, preparation, Physical, Chemical properties, tests to distinguish between primary, secondary and tertiary amines</p>
24.	<p>Polymers: Polymerization, Classification of polymers based on : origin, structure, molecular forces, mode of polymerization. Addition polymerization Condensation polymerization(Step-growth polymerization) Preparation of condensation polymers Synthetic and natural rubber and vulcanization, Determination of molecular mass of polymers.: Poly dispersity index(PDI). Bio-degradable polymers like PHBV.</p>
25.	<p>Biomolecules(Biochemistry):Carbohydrates: Classification of carbohydrates , Structural determination of glucose and fructose on the basis of their chemical properties, Open chain (Fischer) structure, cyclic structure(Haworth form), α and β forms of glucose, Mutarotation, anomers and epimers, Chemical reactions of glucose, Reducing and non-reducing sugars, Configuration of glucose and fructose. Disaccharides Sucrose, Haworth representation of disaccharides, Polysaccharides, Starch, Cellulose, and amylopectin structures, Functions of Carbohydrates in living organisms. Carbohydrate metabolism, glycolysis, electron-transport chain, Proteins: Amino acids, Zwitter ion, Iso-electric point, peptides and peptide bond, Fibrous proteins, Globular proteins and their functions, Primary, Secondary(Helix and pleated sheet structures) and tertiary structure of proteins, denaturation and renaturation, Enzymes, specificity and mechanism of enzyme activity , coenzymes, applications of enzymes. Nucleic acids : Nucleosides, Nucleotides, Structure of ATP, Photosynthesis(Light and dark reactions) Primary and Secondary structure of DNA(Double Helix structure) , biological functions of nucleic acids, Replication, Protein synthesis (Transcription, Translation, mutation), genetic code, genetic errors, Vitamins, classification, diseases caused by the deficiency of vitamins, Hormones (steroid hormones and non-steroid hormones) and their functions.</p>
26.	<p>Chemistry in Everyday life: Drugs and medicines - designing a drug, drug metabolism, classification of drugs, enzymes as drug targets, action of drug through drug receptor interaction, types of drugs: Antipyretics, Analgesics, antiseptics, disinfectants, tranquilizers, antimicrobials, antibiotics(Narrow spectrum and broad spectrum antibiotics), antifertility drugs, antihistamines, antacids. Chemicals in food, Food preservatives, artificial sweetening agents, Soaps and detergents, Preparation soaps(Saponification) and detergents, cleansing action of soaps, advantages of detergents over soaps, Deodorants, Edible colours, antioxidants.</p>

Syllabus for written examination for PGT (Phy)

Unit I: Physical World and Measurement

Need for measurement: Units of measurement; systems of units; SI units, fundamental and derived units. Length, mass and time measurements; accuracy and precision of measuring instruments; errors in measurement; significant figures. dimensional analysis and its applications.

Unit II: Kinematics

Frame of reference. Motion in a one, two and three dimension: Position-time graph, speed and velocity.

Uniform and non-uniform motion, average speed and instantaneous velocity.

Uniformly accelerated motion, velocity-time, position-time graphs, relations for uniformly accelerated motion. Vectors: Position and displacement vectors, addition and subtraction of vectors. Relative velocity, scalar product of vectors, Vector product of vectors.

Unit vector; Resolution of a vector in a plane - rectangular components. Motion in a plane. Cases of uniform velocity and uniform acceleration-projectile motion.

Unit III: Laws of Motion

Intuitive concept of force. Inertia, Newton's first law of motion; momentum and Newton's second law of motion; impulse; Newton's third law of motion. Law of conservation of linear momentum and its applications.

Equilibrium of concurrent forces. Types of friction, laws of friction, Dynamics of uniform circular motion.

Unit IV: Work, Energy and Power

Work done by a constant force and a variable force; kinetic energy, work-energy theorem, power.

Notion of potential energy, potential energy of a spring, conservative forces: conservation of mechanical energy (kinetic and potential energies); non-conservative forces: elastic and inelastic collisions in one and two dimensions.

Unit V: Motion of System of Particles and Rigid Body

Centre of mass of a two-particle system, momentum conservation and centre of mass motion. Centre of mass of a rigid body; centre of mass of uniform rod.

; moment of a force, torque, angular momentum, conservation of angular momentum with some examples.

Dynamics of rigid bodies, comparison of linear and rotational motions; moment of inertia, radius of gyration.

Values of moments of inertia for geometrical objects. Parallel and perpendicular axis theorems and their applications.

Unit VI: Gravitation

Keplar's laws of planetary motion. The universal law of gravitation.

Variation of Acceleration due to gravity and with altitude, latitude and depth.

Gravitational potential energy; gravitational potential. Escape velocity. Orbital velocity of a satellite. Geo-stationary satellites.

Unit VII: Properties of Bulk Matter

Elastic behaviour, Stress-strain relationship, Hooke's law, modulus of elasticity.

Pressure due to a fluid column; Pascal's law and its applications

Viscosity, Stokes' law, terminal velocity, Reynold's number, streamline and turbulent flow. Bernoulli's theorem and its applications.

Surface energy and surface tension, application of surface tension ideas to drops, bubbles and capillary rise.

Heat, temperature, thermal expansion; specific heat - calorimetry; change of state - latent heat.

Heat transfer-conduction, convection and radiation, thermal conductivity, Newton's law of cooling.

Unit VIII: Thermodynamics

Thermal equilibrium and definition of temperature (zeroth law of thermodynamics). Heat, work and internal energy. First law of thermodynamics.

Second law of thermodynamics: reversible and irreversible processes. Heat engines and refrigerators. Carnot cycle and Carnot's theorem.

Equation of state of a perfect gas, work done on compressing a gas.

Kinetic theory of gases, degrees of freedom, law of equipartition of energy and application to specific heats of gases; concept of mean free path, Avogadro's number.

Unit IX: Oscillations and Waves

Periodic motion - period, frequency, displacement as a function of time. Periodic functions. Simple harmonic motion (S.H.M) and its equation; phase; oscillations of a spring-

restoring force and force constant; energy in S.H.M.-kinetic and potential energies; simple pendulum-derivation of expression for its time period; free, forced and damped oscillations, resonance.

Wave motion. Longitudinal and transverse waves, speed of wave motion. Displacement relation for a progressive wave. Principle of superposition of waves, reflection of waves,

standing waves in strings and organ pipes, fundamental mode and harmonics, Beats, Doppler effect.

Unit X: Electrostatics

Electric Charges; Conservation of charge, Coulomb's law and its application, force between two point charges, forces between multiple charges; superposition principle and continuous charge distribution. Electric field, electric field due to a point charge, electric field lines; electric dipole, electric field due to a dipole; torque on a dipole in uniform electric field. Gauss's theorem and its applications. Electric potential, potential difference, electric potential due to a dipole and system of charges; equipotential surfaces, electrical potential energy of a system of two point charges and of electric dipole in an electrostatic field. Conductors and insulators, free charges and bound charges inside a conductor. Dielectrics and electric polarisation, capacitors and capacitance, combination of capacitors, capacitance of a parallel plate capacitor with and without dielectric medium between the plates, energy stored in a capacitor. Van de Graaff generator.

Unit XI: Current Electricity

Electric current, flow of electric charges in a metallic conductor, drift velocity, mobility and their relation with electric current; Ohm's law, electrical resistance, V-I characteristics (linear and non-linear), electrical energy and power, electrical resistivity and conductivity. Carbon resistors, colour code for carbon resistors; series and parallel combinations of resistors; temperature dependence of resistance. Internal resistance of a cell, potential difference and emf of a cell, combination of cells in series and in parallel. Kirchhoff's laws and its applications. Potentiometer - principle and its applications. Thermal and chemical effect of current.

Unit XII: Magnetic Effects of Current and Magnetism

Biot - Savart law and its application. Ampere's law and its applications to infinitely long straight wire, straight and toroidal solenoids. Lorentz's force. Cyclotron, synchrotron. Interaction of a current-carrying conductor with magnetic field. Force between two parallel current-carrying conductors. Torque experienced by a current loop in uniform magnetic field and its application; Current loop as a magnetic dipole and its magnetic dipole moment. Magnetic dipole moment of a revolving electron. Magnetic field intensity due to a magnetic dipole (bar magnet) along its axis and perpendicular to its axis. Torque on a magnetic dipole (bar magnet) in a uniform magnetic field; bar magnet as an equivalent solenoid, magnetic field lines; Earth's magnetic field and magnetic elements. Para-, dia- and ferro - magnetic substances, with examples. Electromagnets and factors affecting their strengths. Permanent magnets.

Unit XIII: Electromagnetic Induction and Alternating Currents

Electromagnetic induction; Faraday's law, induced emf and current; Lenz's Law, Eddy currents. Self and mutual inductance. Need for displacement current. Alternating currents and its measurement reactance and impedance; LC oscillations, LCR series circuit, resonance; power in AC circuits, generator, motors and transformer.

Unit XIV: Optics

Reflection of light, spherical mirrors, mirror formula. Refraction of light, total internal reflection and its applications, optical fibres, refraction at spherical surfaces, lenses, thin lens formula, lens-maker's formula. Magnification, power of a lens, combination of thin lenses in contact. Refraction and dispersion of light through a prism. Scattering of light and its application. Optical instruments: Human eye-eye defects and its correction. Microscopes and astronomical telescopes and their magnifying powers. Wave optics: wave front and Huygens' principle, reflection and refraction of plane wave at a plane surface using wave fronts. Proof of laws of reflection and refraction using Huygens' principle. Interference, Young's double slit experiment and expression for fringe width, coherent sources and sustained interference of light. Diffraction due to a single slit, width of central maximum. Resolving power of microscopes and astronomical telescopes. Polarisation, plane polarised light; Brewster's law, uses of plane polarised light and Polaroids.

Unit XV: Modern Physics

Dual nature of radiation. Photoelectric effect, Hertz and Lenard's observations; Einstein's photoelectric equation-particle nature of light. Compton effect, diffraction of X-rays, Bragg's law, Hall effect. Matter waves-wave nature of particles, de Broglie relation. Davisson-Germer experiment. Alpha-particle scattering experiment; Rutherford's model of atom; Bohr model, energy levels, hydrogen spectrum. Composition and size of nucleus, packing fraction and magnetic moment, atomic masses, isotopes, isobars; isotones. Radioactivity-alpha, beta and gamma particles/rays and their properties; radioactive decay law. Mass-energy relation, mass defect; binding energy per nucleon and its variation with mass number; liquid drop model of nucleus, nuclear fission and fusion, critical mass, chain reaction

and fission reaction, ionization chamber, Geiger counter and scintillation counter, linear accelerator.

Unit XVI: Electronic Devices

Semiconductors; semiconductor diode – I-V characteristics in forward and reverse bias, diode as a rectifier; I-V characteristics of LED, photodiode, solar cell, and Zener diode; Zener diode as a voltage regulator. Junction transistor, transistor action, characteristics of a transistor; transistor as an amplifier (common emitter configuration) and oscillator. Logic gates and its combination. Transistor as a switch.

SYLLABUS FOR WRITTEN EXAMINATION FOR PGT HISTORY

INDIAN HISTORY

- Harappan Civilization –
- Town Planning
 - Religion
 - Economic & Social Life
 - Script Writing
- Rise of Magadh in relation to 16 Mahajanpadas**
 - Rise of Heterodox sects with special reference to Buddhism, Jainism –
 - Rise
 - Teaching
 - Comparison
 - Effect on society, trade & commerce
 - The Mauryas –
 - Causes for its rise
 - Chandragupta Maurya Administration
 - Contribution of Ashoka the Great (all aspects)
 - Decline and fall of Mauryan Empire
 - The Guptas –
 - Golden Period
 - Samudra Gupta
 - Chandragupta Vikramaditya etc
 - Administration, Religion, Trade & Commerce
 - Society & Economy – From Vedic till 7th century
 - Sultanate Era – The Defeat of Hindu kingdom and establishment of Delhi Sultanate
 - Mughal Period – 1526 to 1707(all aspects)
 - Polity
 - Administration
 - Society
 - Economy
 - Medieval Period – Society and Culture with special Reference to Bhakti Movement and Sufism
 - Medieval Architecture – Delhi Sultanate 'n Mughal Period
 - The Advent of Europeans and the establishment of British rule
 - British rule and its impact on Indian economy
 - Revolt 1857 –
 - Nature
 - Causes
 - Leadership
 - Events
 - Consequences
 - Causes of defeat
 - Impact
 - The socio – religious reform movements and the rise of nationalism
 - The Indian freedom movement - 1885 to 1947
 - Constitution –
 - Framing
 - Features
 - Working of the Constitution
 - Adoption of the Constitution

HISTORY OF THE WORLD

- Rise of Ancient Civilizations with special reference to Mesopotamia –**
 - Urbanization
 - Script
 - Trade
 - Calendar
- Roman and Greek civilization**
 - Rise of the empire
 - Administration
 - Society
- Rise of Islam –**
 - Teachings
 - Culture
 - Crusades
- Nomadic people of Central Asia**
- The Dark age - Feudalism in Europe**
 - Manor State
 - Decline
- Renaissance 'n Reformation period in Europe**

7) Capitalism and Mercantilism

- a. Industrial Revolution
- b. Imperialism and colonialism

8) China Since 1840 to 1949

9) Japan 1840 to 1949

Syllabus for Written Examination for PGT (Geography)

Topic I: Geography as a discipline-

Geographical ideas in ancient, medieval & modern periods: the contributions of Varenus, Kant, Reine, Humboldt and Ritter. Influence of Richthofen and Darwin. Vidal-da-la Blache, F. Ratzel etc.

Contemporary geography: Post Second World War, Environmentalism, Areal Differentiation, spatial organization, Behavioural and perceptual Geography. Positivism in Geography. Humanistic Geography. Marxist Geography and critical social theory. Development in Indian Geography.

Topic-2 Origin and Evolution of the Earth-

Introduction to the solar system,

Motions of Earth: Rotation, Revolution, Occurrence of Day and Night; change of seasons; Latitudes and Longitudes; Finding time.

Earth's Interior: Origin of continents and ocean basins Wegener's Continental drift theory, Theory of Plate Tectonics Earthquakes and Volcanoes, Folding and faulting

Origin of the Earth: Nebular hypothesis (old Theory) and Big-Bang Theory. Evolution of continents, atmosphere and oceans.

Topic-3 Interior of the Earth and Distribution of oceans and continents-

Constitution of Earth's interior (based on Seismic Evidences), origin of the continents and ocean basins. Wegner's theory of Continental drift and Plate Tectonics. Plate movements and interactions-Volcanism and seismicity.

Topic-4 Landforms-

Mineral and rocks- classification of rocks, rock cycle. Important minerals geomorphic process of denudation Endogenic and Exogenic processes. Mass Wasting, Landslide, Work of River, Glacier Wind, Sea Waves etc, processes of soil formation.

Topic-5 Climate:

Atmosphere: Composition and structure. Insolation and temperature, Atmospheric pressure and winds, Atmospheric moisture, cyclones, classification of climate (Koeppen and Thornthwaite Schemes classification). Global climatic changes: Causes and effects.

Topic-6 Water (Ocean)

Geomorphology of the ocean floor, submarine relief features of Atlantic, Pacific and Indian Ocean. Movement of ocean water: Currents, tides and waves. Marine deposits and coral reefs.

Topic -7 Life on the Earth

Approaches in environmental Geography, landscape, ecosystem and perception approaches, Man and the Biosphere: Interactive and dynamic relationship. Human impact on biogeochemical cycles.

Topic-8 India:

Geographical basis of Indian State-territory; location, extent, shape and size.

Topic-9 Physiography:

Structure, Physiographic divisions, Drainage system and its evolution.

Topic-10 Climate, Vegetation and Soil-

Climate: factors controlling climate of India

Origin and mechanism of Indian monsoon; Seasons of India, Classification of climate of India (Koeppen's, Thornthwaite, Triwartha).

Soils: Type and distribution (I.C.A.R.), Soil problems, conservation of soil

Vegetation- Types & Distribution; conservation

Wild Life- its conservation.

Topic-11 Natural Hazards and disasters-

Causes, Consequences and management in India Environmental Hazards: Floods, droughts, cyclones, earthquakes and landslides; human adjustment to hazards; hazards perception and mitigation; environmental institutions and legislation in India.

Topic-12 Human Geography: Nature and Scope.

Nature and scope of Human Geography, Approaches to the Human Geography, Determinism, Environmental Determinism, Possibilism, Neo-determinism, ecological and Behaviouralism.

Topic -13 People (World and India)

Trends and patterns of population growth: determinants and patterns of population distribution; theories, demographic transition; Human migration, Patterns of human development.

Topic-14 Human Activities: (World and India)

Primary: -Hunting, gathering, Herding (Nomadic & Commercial) Lumbering fishing, mining and agriculture; Agricultural practices; some major crops.

Secondary: - Industries: Classification, Theories of localization, major Industries, recent trends in industries, world comparisons.

Tertiary:-(Services)

Quaternary:-Quinary activities

Planning in India: target area planning, idea of sustainable development

Topic-15 Transport, Communication and Trade(World and India)

Transport and communication Roads, railways, waterways and airways; oil and gas pipelines, national electric grids. Communication networking-radio, television, satellite and Internet.

International Trade-Basis and components, trade balance, major trading organizations, changing pattern of India's foreign trade, sea-routes, inland water-ways, sea ports and their hinter-land.

Topic-16 Human settlements (World and India)

Unstable and stable settlements, rural settlements: origin, types and patterns; Urban settlements: Origin and growth of towns; functional classification of towns. Problems of urbanization in the world; urbanization in India; Urban slums and squatters. Morphology of cities; distribution of Mega-cities, problems of human settlements in Developing countries.

Topic -17 Geographical perspective on selected issues and problems

Environmental pollution-Land, Water, Air, Noise, Global Warning, Poverty, Food Security; Sustainable Development.

Topic -18 General Cartography (Practicals)

Elements and classification of maps, scales, map-projections, finding directions, latitudes, longitudes and calculation of local & standard time, Identification & Analysis of relief forms: Topographical Maps and interpretation. Weather-instruments and interpretation of weather maps. Digital mapping, Remote sensing, Visual interpretation. Processing of Data, Thematic mapping, representing statistical data by various diagrams-Bar, Histogram, Pie etc. Spatial Information technology: GIS, GPS, Computers-Software and Hardware components, Data format, Raster and Vector, editing and topology etc. Spatial Analysis; Overlay, Buffer and Proximity analysis.

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