



GOVERNMENT OF ARUNACHAL PRADESH
ARUNACHAL PRADESH STAFF SELECTION BOARD
ITANAGAR

No. APSSB - 13/13/2025 /429

Dated: 05-08-2025

Recruitment Notice
ADVERTISEMENT NO.- 05/25
Non-Ministerial Technical Examination

IMPORTANT NOTICE:- Only online applications will be accepted. Application received through any other mode shall be rejected.

Opening Date of Application:- 04-09-2025 (11:00 AM)
Closing Date of Application:- 30-09-2025 (03:00 PM)
Tentative Date of Written Examination:- 07-12-2025 (SUNDAY)
Tentative Date of PET/PST:- 16-01-2026 onwards
Tentative Date of Driving Test:- 29-01-2026 onwards

Online Applications are invited for **Non-Ministerial (Technical) Examination-2025** from eligible candidates for recruitment to Group 'C' Posts against vacancies for Departments /Offices indicated in table below. Only those applications which are successfully filled through the website of the Board **www.apssb.nic.in** and found in order shall be accepted. Incomplete applications or applications with partial/wrong/irrelevant information or filled with junk characters shall be summarily rejected. Candidates should go through the Recruitment Notice carefully before applying for the posts and ensure that they fulfil all the eligibility conditions like Age/ Educational and other Qualifications / Experience/ Category etc., as indicated against each Post Code in this Notice. Candidature of candidates not meeting the eligibility conditions will be cancelled at any stage of the recruitment process without any notice. Candidature of Applicants shall be purely PROVISIONAL at all stages of the recruitment process.

1. DETAILS OF POSTS:-

Post Code	Name of Post	Level in Pay Matrix	Name of Office/Department	Vacancies				
				APST	UR	Total	PwBD	Ex-SM
30/25	Dental Mechanic	Level-5(29200-92300)	TRIHMS	0	1	1	0	0
31/25	Dental Technician	Level-5(29200-92300)	Health Services	19	5	24	0	0
			TRIHMS	2	0	2	0	0
32/25	Draughtsman Grade - III	Level-5(29200-92300)	UD and Housing	3	0	3	0	0

Post Code	Name of Post	Level in Pay Matrix	Name of Office/Department	Vacancies				
				APST	UR	Total	PwBD	Ex-SM
33/25	Driver (LMV)	Level-4(25500-81100)	Accounts and Treasuries	1	0	1	0	0
			Agriculture	2	0	2	0	0
			Animal Husbandry and Veterinary	2	0	2	0	0
			Civil Aviation	1	0	1	0	0
			DC Tirap	0	1	1	0	0
			DC Upper Subansiri	0	1	1	0	0
			Industries	1	1	2	0	0
			Labour and Employment	1	0	1	0	0
			Legal Metrology and Consumer Affairs	0	1	1	0	0
			Power Electrical	4	0	4	0	0
			Public Libraries	0	1	1	0	0
			Research	3	0	3	0	0
			Secondary Education	2	0	2	0	0
			Skill Development and Entrepreneurship	2	0	2	0	0
			Small Savings	1	0	1	0	0
			Textile and Handicrafts	1	0	1	0	0
			Transport	6	1	7	0	0
			Women and Child Development	6	2	8	0	0
34/25	ECG Technician	Level-5(29200-92300)	Health Services	8	3	11	0	0
			TRIHMS	3	0	3	0	0
35/25	EEG (Electro Encephelography) Technician	Level-5(29200-92300)	TRIHMS	0	1	1	0	0
36/25	Field Publicity Assistant	Level-2(19900-63200)	IPR	2	1	3	0	1
37/25	Head Constable Driver	Level-4(25500-81100)	Fire and Emergency Services	36	3	39	0	3

Post Code	Name of Post	Level in Pay Matrix	Name of Office/Department	Vacancies				
				APST	UR	Total	PwBD	Ex-SM
38/25	Health Assistant Jr.	Level-4(25500-81100)	Health Services	22	6	28	0	0
39/25	Junior Estimator	Level-5(29200-92300)	Hydropower	2	0	2	0	0
			Public Health Engineering and Water Supply	2	2	4	0	0
			Public Works Department	21	0	21	1	0
			Water Resources Department	2	0	2	1	0
40/25	Junior Librarian	Level-4(25500-81100)	Public Libraries	5	1	6	0	0
41/25	Operation Theatre Technician	Level-5(29200-92300)	Health Services	5	2	7	0	0
			TRIHMS	6	2	8	0	0
42/25	Pharmacist (Allopathy)	Level-5(29200-92300)	Health Services	5	1	6	0	0
43/25	Publicity Assistant	Level-1(18000-56900)	IPR	3	1	4	0	1
44/25	Radiography Technician	Level-5(29200-92300)	TRIHMS	6	1	7	0	0
45/25	Surveyor	Level-4(25500-81100)	Public Health Engineering and Water Supply	5	1	6	0	0
			Water Resources Department	8	2	10	1	0
Grand Total				198	41	239	3	5

NOTE:-

1. The total number of vacancies may vary.
2. The category of disability and reservation for 02 (two) vacancies reserved for Person with Benchmark disability (PwBD) under Water Resource Department is for PwBD Deaf and Hard of Hearing.
3. The category of disability and reservation for 01 (one) vacancy reserved for Person with Benchmark disability (PwBD) under Public Works Department is for PwBD Blindness and Low Vision.
4. Two (02) vacancies under IPR and Three Vacancies under Fire and Emergency Service are reserved for Ex-SM, meaning Ex- Serviceman who have Served in any rank in the Army, Navy or the Air force of the Indian Union.
5. **Driving License of candidates for Post Codes 33/25 & 37/25 should be valid during key stages of the examination, namely, the closing date of application (30-09-2025), the date of the driving test and the date of document verification.**

2. EDUCATIONAL QUALIFICATIONS, EXPERIENCE, PAY SCALE, AGE LIMIT AS PER RECRUITMENT RULES: -

Table No - 1

Post Code	30/25
Name of Post	Dental Mechanic
Educational and Other Qualifications	Class XII Science from recognized Board or University with Diploma in Dental Mechanic/ Technician from an institute recognized by the Dental Council of India and should be registered under the Arunachal Pradesh State Dental Council (APSDC) / Dental Council of India.
Pay Matrix Level	Level-5(29200-92300)
Age Limit	Between 18 to 35 years with 5(five) years relaxation for APST candidates in accordance with the instructions/orders issued by the Government of Arunachal Pradesh from time to time.

Table No - 2

Post Code	31/25
Name of Post	Dental Technician
Educational and Other Qualifications	Class XII Science from recognized Board or University with Diploma in Dental Mechanic/ Technician from an institute recognized by the Dental Council of India and should be registered under the Arunachal Pradesh State Dental Council (APSDC) / Dental Council of India.
Pay Matrix Level	Level-5(29200-92300)
Age Limit	Between 18 to 35 years with 5(five) years relaxation for APST candidates in accordance with the instructions/orders issued by the Government of Arunachal Pradesh from time to time.

Table No - 3

Post Code	32/25
Name of Post	Draughtsman Grade - III
Educational and Other Qualifications	Minimum class X pass with 2 (two) years on Draughtsmanship from a recognized institution or Diploma in Civil Engineering.
Pay Matrix Level	Level-5(29200-92300)
Age Limit	Between 18 to 35 years. Age relaxable for APST etc., in accordance with the instructions/orders issued by the Government of Arunachal Pradesh from time to time.

Table No - 4

Post Code	33/25
Name of Post	Driver (LMV)
Educational and Other Qualifications	i) Class X pass Certificate from a recognized Board or Institution ii) Possession of Valid Driving License for Light Motor Vehicle or Heavy Motor Vehicle iii) Experience of driving light motor vehicle or heavy motor vehicle for at least 3 years
Pay Matrix Level	Level-4(25500-81100)
Age Limit	Between 18 to 35 years with 5(five) years relaxation for APST candidates in accordance with the instructions/orders issued by the Government of Arunachal Pradesh from time to time.

Table No - 5

Post Code	34/25
Name of Post	ECG Technician
Educational and Other Qualifications	Class XII (Science) and Diploma in ECG Technology from a Government recognized Institution/Board.
Pay Matrix Level	Level-5(29200-92300)
Age Limit	Between 18 to 35 years with 5(five) years relaxation for APST candidates in accordance with the instructions/orders issued by the Government of Arunachal Pradesh from time to time.

Table No - 6

Post Code	35/25
Name of Post	EEG (Electro Encephelo Graphy) Technician
Educational and Other Qualifications	B.Sc. or equivalent from a recognized university with Diploma in EEG Techniques. Candidates possessing the educational qualification with 01 (one) year practical experience as EEG Technician in a Government organization or reputed hospital.
Pay Matrix Level	Level-5(29200-92300)
Age Limit	Between 18 to 35 years with 5(five) years relaxation for APST candidates in accordance with the instructions/orders issued by the Government of Arunachal Pradesh from time to time.

Table No - 7

Post Code	36/25
Name of Post	Field Publicity Assistant

Educational and Other Qualifications	Minimum educational qualification is Class XII (twelve) passed from a recognized Board/University with Diploma in TV, Radio/Sound System or Diploma in Electrical or Electronics.
Pay Matrix Level	Level-2(19900-63200)
Age Limit	Between 18 to 35 years with 5(five) years relaxation for APST candidates in accordance with the instructions/orders issued by the Government of Arunachal Pradesh from time to time.

Table No - 8

Post Code	37/25		
Name of Post	Head Constable Driver		
Educational and Other Qualifications	1. Class X Passed or equivalent from recognized Board and possession of valid Driving License for Heavy Motor Vehicle		
	2. Physical Standards		
	Particulars	Category	Male
	Height	General	165 cm
		APST (other than Tirap/Changlang/Longding districts)	160 cm
		APST (Tirap/Changlang/Longding districts)	152 cm
	Chest	All category	79 cm (Normal) 84 cm (expansion)
	3. Physical Efficiency Test		
	Sl. no.	Event	Male
	a	100 m race	16 sec
b	1500 m race	8 mins 30 sec	
c	High Jump (Maximum 3 attempts)	107 cm	
d	Long Jump (Maximum 3 attempts)	11 ft	
4. Both eye vision:			
Distant vision – better eye (corrected vision) – 6/6, worse eye (corrected vision) – 6/12. Near vision J1 (corrected) J2 (corrected), No colour blindness.			
5. Medical Fitness Test			

Pay Matrix Level	Level-4(25500-81100)
Age Limit	Between 18 to 32years with 5(five) years relaxation for APST candidates in accordance with the instructions/orders issued by the Government of Arunachal Pradesh from time to time.

Table No - 9

Post Code	38/25
Name of Post	Health Assistant Jr.
Educational and Other Qualifications	Class XII passed with 2 (two) years Health Assistant Training Course from any Institution recognized by Govt of Arunachal Pradesh/Government of India
Pay Matrix Level	Level-4(25500-81100)
Age Limit	Between 18 to 35 years. Age relaxable for APST etc in accordance with the instructions/orders issued by the Government of Arunachal Pradesh from time to time.

Table No - 10

Post Code	39/25
Name of Post	Junior Estimator
Educational and Other Qualifications	Minimum class X pass with 2 (two) years on Draughtsmanship from a recognised institution or Diploma in Civil Engineering.
Pay Matrix Level	Level-5(29200-92300)
Age Limit	Between 18 to 35 years. Age relaxable for APST etc in accordance with the instructions/orders issued by the Government of Arunachal Pradesh from time to time.

Table No - 11

Post Code	40/25
Name of Post	Junior Librarian
Educational and Other Qualifications	Bachelor of Library and Information Science from a recognized University
Pay Matrix Level	Level-4(25500-81100)
Age Limit	Between 18 to 35 years. Age relaxable for APST etc in accordance with the instructions/orders issued by the Government of Arunachal Pradesh from time to time.

Table No - 12

Post Code	41/25
Name of Post	Operation Theatre Technician
Educational and Other Qualifications	B.Sc. Operation Theatre Technology (BOTT) from a recognized Government University. OR Class XII (Science) with Diploma Certificate Course in Operation Theatre Technology (DOTT) from a Government Recognized Institution/Board.
Pay Matrix Level	Level-5(29200-92300)
Age Limit	Between 18 to 35 years. Age relaxable for APST etc in accordance with the instructions/orders issued by the Government of Arunachal Pradesh from time to time.

Table No - 13

Post Code	42/25
Name of Post	Pharmacist (Allopathy)
Educational and Other Qualifications	Class-XII (Science) passed from a recognized Institution/Board with Diploma in Pharmacy (D.Pharm.) from any Institution/Board recognized by Pharmacy Council of India (PCI) and must be registered under the Arunachal Pradesh Pharmacy Council/India Pharmacy Council.
Pay Matrix Level	Level-5(29200-92300)
Age Limit	Between 18 to 35 years. Age relaxable for APST etc in accordance with the instructions/orders issued by the Government of Arunachal Pradesh from time to time.

Table No - 14

Post Code	43/25
Name of Post	Publicity Assistant
Educational and Other Qualifications	Minimum educational qualification is Class X passed from a recognized Board with Diploma certificate in Sound System or Diploma in TV and Radio/Diploma in Electrical or Electronics
Pay Matrix Level	Level-1(18000-56900)
Age Limit	Between 18 to 35 years. Age relaxable for APST etc in accordance with the instructions/orders issued by the Government of Arunachal Pradesh from time to time



Table No - 15

Post Code	44/25
Name of Post	Radiography Technician
Educational and Other Qualifications	B.Sc. or equivalent from a recognized university, with Diploma in Radiology Techniques. Desirable: Candidates possessing the educational qualification with 01 year practical experience as Radiology Technician in a Government organization or reputed hospital
Pay Matrix Level	Level-5(29200-92300)
Age Limit	Between 18 to 35 years. Age relaxable for APST etc in accordance with the instructions/orders issued by the Government of Arunachal Pradesh from time to time.

Table No - 16

Post Code	45/25
Name of Post	Surveyor
Educational and Other Qualifications	Diploma in Surveyor or Diploma in Civil Engineering from a recognized institution
Pay Matrix Level	Level-4(25500-81100)
Age Limit	Between 18 to 35 years with 5(five) years relaxation for APST candidates in accordance with the instructions/orders issued by the Government of Arunachal Pradesh from time to time.

- Candidates will have to provide any one of Photo Identity Documents viz. **Aadhaar Card/Voter ID Card/Driving License/PAN Card/ any government authorized Photo Identity Document**. They will have to carry the same ID card in original along with the admit card to the examination centre, failing which they shall not be allowed to appear in the examination. The particulars of candidate such as name, father name etc indicated in Photo Identity Documents of candidates should match with admit card of the candidate issued by the Board.
- The candidates eligible and applying for more than 1 (one) post shall mandatorily indicate their preference of post while filling the online application form.
- Candidates shall also mandatorily indicate their preference of Department/Office in their online application form in case the same post is vacant in more than one Department/Office.
- Candidates will be allowed to mark their preference only against the vacancies for which they are eligible as per the details provided in the application form and the eligibility criteria mentioned in this advertisement.
- Applicants are advised to carefully think and indicate their order of preference. Preference once submitted shall be deemed final and under no circumstance will the candidates be allowed to change their order of preference at later stage.

- In case the candidate indicates as "Not interested" against any of the post/department/office preferences, he/she shall not be considered for that post/department/office.
- The merit list of the candidate shall be determined as per order of preference indicated by the candidate.

3. EXAMINATION FEES AND MODE OF PAYMENT:-

- A Non-Refundable Fee of Rs. 150 for APST candidates and Rs. 200 for General candidates (to be paid online only).
- Persons with Disabilities (PwD) are exempt from paying the fees.

4. ELIGIBILITY CRITERIA:-

1. The candidate must be a citizen of India.
2. **The educational qualification, age, experience and other qualifications as stipulated in the advertisement shall be determined as on the closing date of submission of application.**
3. The 3 (three) year experience prescribed for **33/25 Driver (LMV)** shall be determined from date of issue of driving license.

5. SCHEME OF EXAMINATION:-

The scheme of examination for the various posts will comprise of one or multiple stages as outlined below:

Stage	Post Code
Stage- I: Objective Type Multiple Choice Questions	All Posts
Stage-II: Physical Standard Test (PST) and Physical Efficiency Test (PET)	37/25 Head Constable Driver
Stage- III: Driving Test	33/25 Driver (LMV) 37/25 Head Constable Driver
Stage- IV: Medical Fitness Test	37/25 Head Constable Driver

Note:

- Candidates for the post **33/25 Driver (LMV)** should note that they shall be required to appear for both **Stage- I: Objective Type Multiple Choice Questions** and **Stage- III: Driving Test.**
- Candidates for the post **37/25 Head Constable Driver** should note that they shall be required to appear for **all four stages.**



Stage- I (Objective Type Multiple Choice Questions) 200 Marks:

The test will comprise of one Common Paper for all candidates and 13 different Technical Papers for the various posts.

COMMON PAPER				
Sections	Number of Questions	Marks per question	Total marks	Duration
a) General Awareness	10	2.5	25	1 hour
b) General Intelligence and Reasoning Ability	10	2.5	25	
c) Arithmetical Ability	10	2.5	25	
d) Test of English Language and Comprehension	10	2.5	25	
Sub-Total			100	
TECHNICAL PAPER				
Various Technical Papers	50	2	100	1 hour
Total			200	2 hours

SYLLABUS:**(a) General Awareness – 25 marks (10 questions of 2.5 marks each)**

Questions in this section will test the candidate's General Awareness of the environment around him/her and its application to society. The questions will be designed to test knowledge of Current Events and of such matter of everyday observation as may be expected of an educated person. The test will also include questions relating to History, Polity, Constitution, Sports, Art & Culture, Geography, Economics, Everyday Science, Scientific Research, National/International Organizations/Institutions, etc. State Specific questions may also be asked.

(b) General Intelligence & Reasoning Ability - 25 marks (10 questions of 2.5 marks each)

The syllabus of General Intelligence & Reasoning Ability includes questions of both verbal and non- verbal types. Test may include questions on analogies, similarities, differences, space visualization, problem solving, analysis, judgment, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning, verbal and figure classification, arithmetical number series, etc. The test will also include questions designed to test the candidate's abilities to deal with abstract ideas and symbols and their relationship, arithmetical computation and other analytical functions.

(c) Arithmetical Ability – 25 marks (10 questions of 2.5 marks each)

The test of Arithmetical and Numerical Abilities will cover Number Systems including questions on Simplification, Decimals, Data Interpretation, Fractions, L.C.M, H.C.F, Ratio & Proportion, Percentage, Average, Profit & Loss, Discount, Simple & Compound Interest, Mensuration, Time & Work, Time & Distance, Tables & Graphs.

(d) Test of English Language and Comprehension – 25 marks (10 questions of 2.5 marks each)

Questions in this component will test the candidate's understanding and knowledge of English

Language and will be based on spotting the error, filling in the blanks, synonyms, antonyms, spelling/detecting misspelled words, idioms & phrases, one word substitution, improvement of sentences, active/ passive voice of verbs, conversion into direct/ indirect narration, shuffling of sentence parts, shuffling of sentences in a passage, cloze passage & comprehension passage.

(e) Technical Paper – 100 marks (50 questions of 2 marks each)(Appendix 'A')

The Technical Paper for each post is indicated below:

Paper	Post code	Post	Technical Paper
1	30/25 31/25	Dental Mechanic Dental Technician,	Paper 1 (Dental Mechanics/Technician)
2	32/25 39/25	Draughtsman Grade - III Junior Estimator	Paper 2 (Draughtsman Grade-III/Junior Estimator)
3	33/25 37/25	Driver (LMV) Head Constable Driver	Paper 3 (Road Safety and Traffic Signages)
4	34/25	ECG Technician,	Paper 4 (ECG Technician)
5	35/25	EEG (Electro Encephelo Graphy) Technician	Paper 5 (EEG Technician)
6	36/25	Field Publicity Assistant	Paper 6 (Field Publicity Assistant)
7	38/25	Health Assistant Jr.	Paper 7 (Health Assistant)
8	40/25	Junior Librarian	Paper 8 (Library and Information Science)
9	41/25	Operation Theatre Technician	Paper 9 (Operation Theatre Technician)
10	42/25	Pharmacist (Allopathy)	Paper 10 (Pharmacist Allopathy)
11	43/25	Publicity Assistant	Paper 11 (Publicity Assistant)
12	44/25	Radiography Technician	Paper 12 (Radiography Technician)
13	45/25	Surveyor	Paper 13 (Surveying)

Note:

- Syllabus for technical papers shall be vide Appendix 'A' of this advertisement.
- A candidate must secure a minimum of 33% aggregate marks in each paper SEPARATELY, i.e., in the Common Paper and Technical Paper separately, in the written examination.
- There is no sectional (subject-wise) cut-off in the Common Paper.
- There is no negative marking.

Stage-II Physical Standard Test (PST) and Physical Efficiency Test (PET):

- The candidates for post codes **37/25 Head Constable Driver** will have to qualify PST and PET as mentioned against the post code at page 6 of this advertisement.
- The total number of candidates shortlisted for Stage II (PET/PST) will be in 1:8 ratio as per merit i.e, if total vacancies are 10 then 80 candidates will be shortlisted for Stage II, subject to the candidate securing minimum of 33% marks in each subject in the written Examination paper.
- The Ex-Servicemen candidates are exempted from appearing the Physical Efficiency Test (PET). However, they will have to appear and qualify the Physical Standard Test (PST).

h

Stage- III (Driving Test)

- i. The candidates for post codes **33/25 Driver (LMV)** and **37/25 Head Constable (Driver)** will have to qualify driving test.
- ii. The total number of candidates shortlisted for Stage III (Driving Test) will be in 1:3 ratio as per merit i.e, if total vacancies are 10 then 30 candidates will be shortlisted for Stage III, subject to the candidate securing minimum of 33% marks in each subject in the written Examination paper and candidate qualifying the PST/PET.

Stage- IV (Medical Fitness Test)

The candidates for post codes **37/25 Head Constable (Driver)** will also have to qualify the medical fitness test as mentioned at page 6 of this advertisement.

Note:

- i. **Stage II (PST/PET), Stage III (Driving Test) and Stage IV (Medical Fitness Test) shall be of Qualifying nature only.**
- ii. The final merit shall be prepared on the basis of marks secured in objective type written examination only.
- iii. Other details, if any, will be informed through the official website.

6. HOW TO APPLY: -

- Candidates must apply online through the website www.apssb.nic.in. The closing date for the submission of online application is 30-09-2025 (3:00 PM), after which the link will be disabled.
- Application received through any other mode would not be accepted and will be summarily rejected.

7. SCANNED COPIES OF FOLLOWING DOCUMENTS AND INFORMATION ARE TO BE ATTACHED/UPLOADED: -

- i. Scanned signature of the candidate on white paper with black ink pen (10-50 kb in jpg/jpeg/png format).
- ii. Latest/recent passport size photo (50-100 kb in jpg/jpeg/png format).

8. PERSONS WITH BENCHMARK DISABILITIES (PwBD):-

A Person with Benchmark Disability (PwBD) means a person with not less than forty percent (40%) of a specified disability where specified disability has not been defined in measurable terms and includes a person with disability where specified disability has been defined in measurable terms, as certified by the certifying authority.

Provision of Compensatory Time and assistance of scribe:

- i. In case of persons with benchmark disabilities (PwBD) in the category of blindness, locomotor

disability (both arms affected-BA) and cerebral palsy, the facility of scribe will be provided, if desired by the candidate.

- ii. In case of remaining categories of persons with benchmark disabilities (PwBD), the provision of scribe will be provided on submission of a certificate, at the time of filling up of online application, from the Chief Medical Officer/ Civil Surgeon/ Medical Superintendent of a Government health care institution as per proforma at Annexure- I*, that the person concerned has physical limitation to write, and scribe is essential to write examination on his behalf.
- iii. The facility of scribe will also be provided to PwD candidates having disability less than 40% and having difficulty in writing, in pursuance to OM No. 29-6/2019-DD-III dated 10.08.2022, issued by Department of Empowerment of Persons with Disabilities, Ministry of Social Justice and Empowerment. The facility will be provided on production of certificate as per Annexure-IA*.
- iv. The facility of scribe will be provided to the PwBD/ PwD candidates only if he has opted for the same in the online application form.
- v. The candidate will have the discretion of opting for his own scribe or to avail the facility of scribe provided by the Board. Appropriate choice in this regard will have to be given by the candidate in the online application form.
- vi. In case the candidate opts for his own scribe, the qualification of the scribe should be one step below the qualification of the candidate taking the examination. The candidates with benchmark disabilities(PwBD) opting for own scribe shall be required to upload the details of the own scribe during the time of online application as per proforma at Annexure-II*.The candidate with disabilities(PwD) eligible for scribe as per Para iii above and opting for own scribe shall be required to upload the details of the own scribe during the time of online application as per proforma at Annexure-IIA*.In addition, the scribe has to produce a valid ID proof Aadhar Card/Voter's ID Card/Driving Licence/PAN Card/Passport/ID Card issued by University or College or School/Employer ID Card/Any other photo bearing ID Card issued by the Central or State Government} 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 uploaded along with proforma at Annexure-II/Annexure-II A.

If subsequently it is found that the qualification of the scribe is not as declared by the candidate, then the candidate shall forfeit his right to the post and claims relating thereto.

- vii. If a candidate opts for his own scribe, in that case that scribe should not be a candidate of this examination. If a candidate is detected as assisting another PwBD/PwD candidate as scribe in this examination, then the candidatures of both the candidates will be cancelled.
- viii. A compensatory time of 20 minutes per hour of examination will be provided to the persons who are allowed use of scribe as described at Para i, ii and iii above.
- ix. The candidates referred at Para i, ii and iii above who are eligible for use of scribe but not availing the facility of scribe will also be given compensatory time of 20 minutes per hour of examination.
- x. No attendant other than the scribe for eligible candidates will be allowed inside the Examination Hall.
- xi. Partially blind candidates who wish to write/ indicate the answer with the help of magnifying glass will be allowed to use the same in the Examination Hall and will not be entitled to a

scribe. Such candidates will have to bring their own magnifying glass to the Examination Hall, after obtaining authorisation from the APSSB.

- xii. The PwBD/ PwD candidates who have availed the facility of scribes and/ or compensatory time must produce original copies of the relevant documents for the eligibility of scribe/ compensatory time at the time of Document Verification. Failure to produce such original documents will lead to cancellation of their candidature for the examination.

*** The proforma of Annexure-I, Annexure-IA, Annexure-II, Annexure-II A will be available on the APSSB website for download.**

9. THE SHORTLISTED CANDIDATES WILL HAVE TO SUBMIT COPIES OF THE FOLLOWING DOCUMENTS / INFORMATION TO THE BOARD DURING DOCUMENT VERIFICATION:-

1. Recent passport size Photograph.
2. Matriculation certificates issued by the Board/University for proof of date of birth.
3. Class XII pass certificate (as applicable).
4. Diploma/Degree certificate issued by the Assistant Registrar/Controller of Examination/Vice Chancellor of the concerned University (as applicable).
5. Diploma/Degree marksheet issued by the Assistant Registrar/Controller of Examination/Vice Chancellor of the concerned University (as applicable).
6. APST Certificate (as applicable).
7. Diploma in Computer certificate (as applicable).
8. Experience certificate (as applicable).
9. **Valid Driving License (as applicable), which should be valid during key stages of the examination, namely, the closing date of application (30-09-2025), the date of the driving test and the date of document verification.**
10. 2 (two) years Health Assistant Training Course from any Institution recognized by Govt of Arunachal Pradesh /Government of India (as applicable).
11. Registration certificate from Arunachal Pradesh State Dental Council (APSDC)/ Dental Council of India **(as applicable)**
12. Registration certificate from Arunachal Pradesh Pharmacy Council/ India Pharmacy Council **(as applicable).**
13. Intimation letter to HoD for those who are in regular Govt. Service.
14. PwBD certificate (for candidates applying for vacancies reserved for PwBD).
15. Pay and Pension Order (PPO) and Discharge book issued by the competent authority (for candidates applying for vacancies reserved for Ex-SM).
16. Admit Card.
17. Any other documents as may be relevant.
 - Provisionally shortlisted candidates will have to upload copies of the above-mentioned documents on the APSSB portal when notified to do so. Any information contained in the attached certificates shall not be considered unless it is claimed in the application form.
 - The candidates will also have to produce original and photocopies of the above-mentioned Certificates/ Documents, as well as the Admit Card and a hard copy print out of the online application form, at the time of verification of documents. Failure to do so will result in summary rejection of candidature. Candidates should duly note that no additional time shall be given for production of documents.

10. IMPORTANT NOTES:-

- i. **There is no provision of re-evaluation /re-checking of Answer Sheet /Answer Scripts in respect of the examinations conducted by APSSB.**
- ii. The APSSB reserves the right to cancel/withdraw any question/questions from the Test.
- iii. The Board makes provisional selection of the candidates on the basis of information provided in the application and documents/certificates provided by the candidate at the time of submission of documents and recommend the same to the indenting/ user department. Further, the Appointing Authority i.e. the indenting/user department verifies and satisfies itself about the authenticity of documents/certificates and eligibility as per the Recruitment Rules before finally appointing the candidate(s). Therefore, the provisional selection of a candidate does not confer upon him/her any right of appointment unless the Appointing Authority is satisfied, after such inquiry as may be considered necessary, that the candidate is suitable in all respects for appointment to the post.
- iv. The Board reserves the right to conduct medical test for examining the candidates belonging to PwD category if it deems necessary.

11. AGE:-

The Lower and Upper age limits of candidates for various posts should be as given herein under as on the closing day of application, i.e., 30-9-2025.

Post code	Age limit
All Post Codes (except 37/25)	18-35 Years
37/25 (Head Constable Driver)	18-32 Years
Category	Age Relaxation
APST	Relaxable upto 05 (five) years.
PwBD	10 (Ten) years upper age relaxation for PwBD (15 years for APST)
Ex-Servicemen	Every Ex-servicemen shall be allowed to deduct the period of such service from his actual age and if the resultant age does not exceed the maximum age limit prescribed for the post or service for which he seeks appointment by more than 3 years, he shall be deemed to satisfy the condition regarding age limit.

An '**Ex-Serviceman (Ex-SM)**' means a person who has served in any rank whether as a combatant or non-combatant in the Regular Army, Navy, and Air Force of the Indian Union.

The detailed definition of 'Ex-Serviceman' shall be as laid down in Rule 2 Clause (c) of the Ex-Serviceman (Re-employment) in Central Civil Services and Posts) Amendment Rules 2012 and the Ex-Servicemen (Re-employment) in Central Civil Services and Posts) Amendment Rule 2020.

12. CENTRES OF EXAMINATION:-

1. The examination will be held in Itanagar Capital Region.
2. The Board reserves the right to cancel any Centre/venue and ask the candidates of that centre/venue to appear from another centre/venue.
3. Board also reserves the right to divert candidates of any centre/venue to some other Centre/venue to take the examination without citing any reasons.

13. GENERAL INSTRUCTIONS FOR CANDIDATES:-

- i. The vacancies published are provisional and subject to change. The Board reserves the right to increase or decrease the vacancies for any post in any category due to administrative reasons or in public interest. In case the vacancy position is reduced to any number or even withdrawn by the user department, the Board shall not be liable to compensate the applicant for any consequential damage/loss.
- ii. The Board reserves the right to reject the candidature of any candidate at any stage of recruitment.
- iii. The Board reserves the right to cancel a part or entire process of examination or a part of it due to administrative reason(s) and in case of unfair means, cheating or other irregularities / malpractice noticed by the Board. The Board also reserves the right to cancel or set up a new examination centre and divert the candidates to appear at that examination centre, if required.
- iv. The Board reserves the right to cancel any centre of exam and ask the candidates of that centre to appear at another centre. The Board also reserves the right to direct the candidates of any centre to another centre to take the exam. No request for change in date, time and centre of exam will be accepted under any circumstances.
- v. The Board reserves the right to change or make amendment in the examination scheme at any time before the examination, if so required.
- vi. The candidature of the candidate to the written examination is provisional and subject to the outcome of any direction/decision/order/pronouncement of any Court of Law and mere issue of Admit Card or appearance at the examination does not entitle him/her to any claim for the post.
- vii. No request or representations will be entertained for issuance of admit cards after closing date for download of admit cards.
- viii. The applicants are advised to fill up the application form carefully. They will not be allowed to edit/modify the details after the closing date. Application with incomplete or invalid details will be summarily rejected.
- ix. In case an applicant applies multiple forms for the same post, only the latest application form shall be considered by APSSB.
- x. Abbreviations used are denoted as under: APST - Arunachal Pradesh Scheduled Tribe, PRC – Permanent Resident Certificate, UR – Unreserved.
- xi. Use of Calculator, Laptop, Palmtop, other digital instrument/Mobile/Cell Phone/Pager/ Watches etc is/are not allowed. In case any candidate is caught / found in possession of any

gadget/instrument, he/she would be debarred from the examination and legal proceedings shall also be initiated against the candidate.

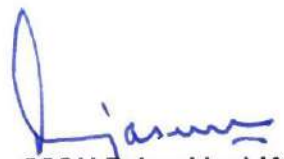
- xii. Candidates are advised not to bring any of the above gadgets in the exam centre as no arrangements for keeping/security of these items would be available at the centre.
- xiii. If any candidate uses offensive/abusive/foul language/obscene picture, he/she will be liable for necessary penal action under relevant provision of the IT Act.
- xiv. Individual Admit Cards will not be sent to the candidates and have to be downloaded from the website www.apssb.nic.in.
- xv. Candidates are advised to keep track of the Board website www.apssb.nic.in for any latest information related to the examination.
- xvi. All concerned shall note that the Board has established series of checks to ensure that there is no impersonation and mischief. The selected candidates will be subjected to detailed scrutiny including document verification and biometrics. Candidates may also note that their candidature is provisional, and if at any stage of examination they are found involved either in violating any of the guidelines or found involved in any malpractices like impersonation, using unfair means etc. then strict action shall be taken against them which may include police action, lodging of FIR and debarment from all future examinations conducted by APSSB.


(YVVJ Rajasekhar) IAS
Secretary cum CoE (APSSB)

Secy-cum-Controller of Exam.
A.P. Staff Selection Board
Govt. of Arunachal Pradesh
Itanagar

Copy To:

1. The Chairman, APSSB for information please.
2. The Member, APSSB for information please.
3. All Deputy Commissioner, Govt. of Arunachal Pradesh for information and with a request for wide publicity in their respective districts.
4. Notice Board.
5. Office Copy.


(YVVJ Rajasekhar) IAS
Secretary cum CoE (APSSB)

Secy-cum-Controller of Exam.
A.P. Staff Selection Board
Govt. of Arunachal Pradesh
Itanagar

Syllabus for Technical Papers

PAPER 1 : DENTAL MECHANIC/TECHNICIAN (30/25 & 31/25)

1. APPLIED PHYSICS:

- Specific gravity, density, properties of matter, including cohesion, capillarity, surface tension viscosity, elasticity, diffusion and osmosis.
- Heat: Temperature and its measurements, Thermometers and Pyrometers. General account of expansion by heat of solids, liquids and gases, Thermostats, Pressure gas and hydraulic. Boyle's and Charle's Laws, Unit of heat, thermal capacity and specific Heat, Change of State: Latent heat: Melting Point.
- Properties of vapours, conduction, convection and radiation.
- Principles of electro-technology applied to dental work room, small motors, constructional features and characteristics, electric furnaces, heaters, thermostats, pyrometers, spot welders electroplating, electro-forming and anodizing, wiring regulations relating to low voltage supplies

2. APPLIED MECHANICS:-

- Forces, Parallelogram and triangle of forces. Moments, Couples, Centre of gravity.

Principles of lever and cantilever work, Energy, Power, Friction, Inclined plane, Screw Stress, Strain, Shearing Strain, Torsion, Bending movements, Strength and stiffness of materials

3. APPLIED CHEMISTRY:-

- Distinction between physical and chemical change: elements, mixture, and compounds; composition of the atmosphere: Oxygen oxides, burning and rusting: water solvent properties and crystallization; action of water on metals: composition of water hydrogen; Laws of chemical combination; meaning of chemical symbols valency: simple chemical equations; acids, bases and salts.
- Electrolysis, The ionic theory of solution. The electropotential series, electroplating, General characteristics of the metals including an elementary study of the common metals and their alloys with special reference to those used in the dental work room.
- Alcohol, ethers, aldehydes and ketones, fatty acids and their more important derivatives, amines. Simple treatment of carbohydrates, fats and proteins, Benzene and its homologues. General characteristics of aromatic substances. Synthetic resins and plastics used in Dentistry.

4. APPLIED ORAL ANATOMY:

- Elementary anatomy and structure of denture/bearing area.

- Human dentition and occlusion.
- Functions of teeth and morphology of Crowns of teeth.
- Muscles of mastication and facial expression.
- Mastication deglutition and phonation.
- Movements of temporo—mandibular joint.

5. DENTAL MECHANICS (PRIMARY):

- Infection control measures for impressions and models.
- Impression Preservation and Boxing-in.
- Cast: Preparation, Trimming, including Orthodontic casts.
- Cast duplication - various methods.
- Construction of special trays—spacers.
- Bite blocks- base plates and wax rims.
- Articulators: Classification, daily uses, and care of articulators.
- Adjustments, Mounting of casts.
- Articulation, Occlusal plane, protrusive balance, working bite, balancing bite, curve of spee, compensating curve, lateral curve.
- Principal of selection of teeth.
- Setting of teeth and wax finishing
- Flasking, Dewaxing, Packing, curing and Deflasking.
- Finishing and polishing of dentures.
- Additions, repairs, relining and revasing of dentures.
- Immediate denture construction.
- Making of acrylic teeth.
- Kennedy's classification of partial dentures.
- Principles of partial denture, design, clasp surveyor, surveying, path of insertion and removal. Establishment of clasp seat. Clasp's. parts, classification, function and reciprocation.
- Principles of wire bending, Preparation of wrought clasps, occlusal rests and lingual bars.

6. DENTAL MECHANICS (FINAL):

- Casting machines: Centrifugal and pressure casting machines, Furnaces, principles of casting.
- Casting techniques of partial denture (Skeletal) Clasps, bars, occlusion rest.
- Setting of teeth and completion of dentures on metal skeletons.
- Mechanical principles of Orthodontic appliances, anchorage, force, tissue changes and retention.
- Stainless steel wire-preparation of clasps, springs and Arch wires for Orthodontic appliances.
- Use of various types of expansion screws.
- Designing- Implant supported Prosthesis (if facilities available for Dental Implants)
- Ceramic, laminates and Veneers.
- Fabricating- Maxillofacial prosthesis such as eye, nose ear, cheek, obturator and splint.
- Indirect Resin Restoration preparation techniques.
- Porcelain firing techniques.
- Preparation of removable Orthodontic appliances, Activators, Retention appliances and Oral screen
- Construction of fixed Orthodontic appliances, bands, tubes and arches.
- Soldering and spot welding-Soldering of clasps, tags, Strengtheners and lingual bars.
- Inlays and Crowns —classification and construction facing & backings. - Casting Procedures.
- Principles of bridge work-types of abutments—abutments and pontics- construction of bridges using porcelain and acrylic pontics.

7. DENTAL MATERIALS AND METALLURGY:

- Dental Materials:- Composition, Properties, Uses, Advantages & Disadvantages of the following materials:-
- Plaster of paris; Dental Stone, Die Stone.
- Investment Materials, All Impression Materials.
- Tray Materials.
- Denture Base Materials, both for cold curing and heat curing, Tooth Materials Waxes.
- Base Plates.
- Zinc Oxide.

- Dental Luting Cements.
- Dental Ceramics and indirect resin restoration materials.
- Dental Metallurgy:
 - Metallurgical Terms,
 - General Study of:
 - a. Metals used in Dentistry particularly Gold, Silver, Copper, Zinc, Tin, Lead and Aluminium.
 - b. Alloys used in Dentistry particularly, Casting Gold Wrought Gold Silver Alloys, Stainless Steel, Chrome Cobalt Alloys.
- Heat treatment - annealing and tempering.
- Solders, Fluxes, Anti Fluxes.
- Tarnish and Corrosion
- Electric Deposition
- Dental implant materials,

8. BASIC KNOWLEDGE OF COMPUTERS:

- General office routine economics, record-keeping services, Professional referrals and computing skill;
- Record keeping of materials indented and Audit of us.
- Receipt and dispatch of work from clinicians.

h

PAPER 2: DRAUGHTSMAN GRADE - III/JUNIOR ESTIMATOR (32/25 & 39/25)

- **Importance of B.I.S.**

Introduction of Code of Practice for Architectural and Building Drawings (IS: 962-1989). Layout of drawing. Lines, Lettering, Dimensioning, Scales and Projection

- **Building materials:-**

Rocks-Classification, types, uses, Stones classification, types, uses, Bricks - Manufacturing classification, types, uses, Lime- classification, types, uses, Pozzolan- classification, types, uses, Cement Manufacturing, classification, types, uses, Clay Products - earthenware, stoneware, porcelain, terracotta, glazing, types, Mortar-. Preparation classification, types, uses Concrete -. Preparation classification, types, uses, Timber - Structure, defect classification, seasoning, uses, admixtures - for cement mortar & cement concrete, classification, types, uses

- **Protective materials:-**

Paints, classification, types, uses, varnishes - classification, types, uses, Metal-classification, types, uses, Plastics -. Classification, types, uses

- **Building Construction: -**

Masonry. Stone masonry Terms used. Classification-Tools, Brick masonry - Technical terms - bonds, types junctions, Hollow block construction -types, admixtures added advantages. Composite masonry:- types

- **Foundation: -**

Soil - bearing capacity, Foundation - objectives, Requirement, types-shallow - spread, isolated or column footing, stepped, combined, continuous, inverted arch, cantilever, grillage, & raft or mat foundation. Deep foundations- piles -Well foundations Machine foundation-general requirements-types-Cofferdam and caisson

- **Permanent & temporary structures: -**

Life of structures, sub structure, super structure, load bearing structure, cavity wall, framed structure,

- **Scaffolding:-**

Parts, types- Shoring- types. Underpinning- purpose, types. Partition - requirements, types. Frame work

- **Treatments for building structure: -**

DPC-Sources and effects of dampness, method. Damp proofing materials - properties, functions, types, Anti-termite treatment objectives &uses, method. Weathering course-purpose, materials required-Fire-proofing. Effect, rules

- **Arches -** Technical terms, types, cantering

- **Lintel-** types-wooden, brick, stone, steel & RCC.

- **Carpentry joints** terms, classification of joints, Uses &types of fixtures & fastenings

- **Doors-Parts, Location, standard sizes, types; Windows-types; Ventilators- purpose-types; Floors-Ground floor & upper floor-Types; Flooring- materials used, types; Stairs- Terms, requirements, headroom, types, turning, materials, Planning, Lift, Escalator, Roofs & Roof coverings -Purposes -Elements- Types:- Flat & pitched, Truss-king post, queen post, mansard, bel-fast, steel, composite. Shell-types-north-light & double curved, Dome. Components, parts, Roof coverings - objectives, types & uses.**

- **Building rules & bye laws:-**

Objectives & importance, Function & responsibility, lay out plan & key plan- composition of submission, drawing. provision for safety requirement of green belt and land

- **Computer aided drafting:-**

Operating system, Hardware & software, Introduction of CAD, Its Graphical User Interface. Method of Installation. Basic commands of CAD.

- **Reinforced cement concrete structure:**

introduction, Bar bending, details as per IS Code. chejjas, Beams and columns, Stairs, One-way slab & two-way slab, Innovative construction, Safety against earthquake, grade of cement, steel-behaviour & test bar-bending schedule, Retaining wall, R.C.C. Framed structure.

- **Steel structures:-**

Common forms of steel sections, Structural fasteners, Joints, tension & compression member-classification, fabrication Construction details

- **House drainage of Building:-**

Introduction, Terms used in PHE, Systems of sanitation, System of house drainage, plumbing, sanitary fittings etc, Purification of water. Types of sewer appurtenance, Systems of plumbing, Manholes & Septic tank, New technology of Plumbing, System.

- **Road:**

Introduction, History of highway development. general principles of alignment. Classification and construction of different types of roads-Component parts, road curves & gradient, Curves-types, designation of curves, setting out simple curve by successive bisection from long chords, simple curve by offsets from long chords.

- **Bridge: -**

Component parts. IRC loading, Selection of type and location, Factors governing the ideal site Alignment of bridge-Foundation -selection-caisson. Cofferdam- types Types of super structure, Substructure-piers, abutments, wing walls- Classification of bridge

- **Railways: -**

Rail gauges, Functions, Requirements, Types, Sections, Length of rail, Welding of rail, wear of rail, Coning of wheels, hogged rail, bending of rail, creep of rail, Causes and prevention of creep. Sleeper and ballast-function-types requirement-materials-rail Fixtures, Fastenings and plate laying- rail Joints-types-fish plate-fish bolt spikes-chairs and keys-bearing plate-block-elastic, base plate Anchors and anti-creepers, Construction of permanent ways.

- **Irrigation Engineering: -**

Terms used in irrigation. Hydrology like duty, delta, base period, intensity of irrigation, hydrograph, peak flow, run off, catchment area, CCA, crops like, rabi, kharif etc... Storage/diversion head work definition: types. Reservoir-types of reservoirs, area, and capacity of reservoir, Dams, weir & barrage- types purposes Hydroelectric project Canals:- classification and distribution system, canal structures. Types of cross drainage works

- **Estimating and Costing: -**

Introduction, Purpose and common techniques, Construction drawing Measurement techniques, Estimate-necessity, importance, types-approximate and detailed estimate-main and sub estimates, revised, supplementary, maintenance/repair estimate taking, off quantities-method, Rate analysis and Specifications, Labour and materials, Schedule of rate, Estimating of irregular boundaries, by trapezoidal and Simpsons formulae

- **Wiring Electrical: -**

Safety precaution and elementary first aid. Artificial respiration and treatment of electrical shock
Elementary electricity. General ideas of supply system. Wireman's tools kit. Wiring materials.
Electrical fittings. System of wirings. Wiring installation for domestic lightings.

- **Surveying: -**

Introduction, History and principle, Objectives. and uses common terms used and definitions,
classification, accuracy, types Main divisions (plane & geodetic), Chaining, bearing & meridian.
Speed in field and office work, Plane meter and pantograph

- **Levelling: -**

auto level introduction, definition, Principle of leveling, Leveling staffs, Its graduation & Types,
Minimum equipment required, Types, Component part and function Temporary and permanent
adjustment, procedure in setting up. Level & horizontal surface. Datum Benchmark, Focussing
& parallax Deduction of levels, types leveling, Contouring Definition -Characteristics Methods
Direct and Indirect methods, Interpolation of Contour-Contour gradient-Uses of Contour plan
and Map.

- **Theodolite Survey: -**

Introduction to Theodolite, identification & understanding of parts, Types, technical terms.
Temporary and permanent adjustments, procedure in setting up, Fundamental lines and
relation Method of measurement of horizontal & vertical angles, Repetition & reiteration
systems. Types of field book, adjustment of Errors while laying a given angle by repetition
method of setting out straight lines, establishing, Latitude and departure, Consecutive co-
ordinates and independent co-ordinates. Instrumental errors, their elimination, permanent
adjustment, care & maintenance of Theodolite. Method of running a traverse, different methods
of measuring angles & bearings. Method of plotting traverses- Gales, traverse system,
checking of measurements of closed & open traverse, use of traverse tables, closing errors
and its adjustment. Technical terms in connection with simple triangulation-base line

- **Total Station: -**

Introduction, components parts, accessories used, characteristics, features, advantages and
disadvantages principle of EDM Working and need Setting and measurement, Electronic,
display & Data reading, Rectangular and polar co-ordinate system Terminology of open and
closed traverse

- **GPS-**

Introduction of GPS system. Co-ordinate and time system. Satellite and conventional geodetic
system. GPS. Signal, code, and biases Role of TRANSIT in GPS development. GPS segment
organisation. GPS survey methods. Basic geodetic co-ordinate Ground support equipment,
signals Tracking devices & system Time measurement and GPS timing Definition and
application of Remote sensing, Photogrammetric, Aerial photography, satellite Images, Pattern
recognition and digital signal

• **PAPER 3: ROAD SAFETY AND TRAFFIC SIGNAGES (33/25,37/25)**

Basic Road Rules, Driving methods and speed limits, Understanding Signals: Knowledge of traffic signage for road safety, Difficult driving conditions: Driving on wet surface, Driving in fog, Night driving, Running on pavement, Brake failure, Towing, Fitness to drive, Basic knowledge about provisions of the Motor Vehicle Act, Essential knowledge about vehicle pollution (Do's and Don'ts), Awareness about documents required for driving- Registration, Licensing, Insurance, Driving Offences, Fitness to drive-First aid kit, Good health & Road safety, Driving under influence of drugs/ liquors.



• **PAPER 4: ECG TECHNICIAN (34/25)**

A) Basics of Anatomy:

1. Introduction to Human Anatomy 2. Cell- Tissues Properties, Different Tissues 3. Digestive System & Hepatobiliary System 4. Respiratory System 5. Cardio Vascular System 6. Lymphatic System 7. Bones and Joints 8. Nervous System 9. Endocrine System 10. Sense Organs 11. Excretory System 12. Reproductive System

B) Basics of Physiology:

Basics of Physiology 1. Introduction to Human Physiology 2. Blood 3. Cardio Vascular System 4. Lymphoid System 5. Digestive System 6. Respiratory System 7. Nervous System 8. Endocrine System 9. Excretory System 10. Reproductive System 11. Sense Organs

C) Basics of Biochemistry:

Introduction to Basics of Bio-chemistry, Reception, Registration and bio-chemical parameters investigated. Glassware and plastic ware used in a bio-chemical laboratory. Instrumental methods of Bio-chemical analysis, Basic lab operations, Water Chemicals and related substances, Prevention, Safety and first aid in lab accidents, Collection of Specimens, Urine biochemical parameters., Units of measurements, Solutions, Carbohydrates, Amino acids and Proteins Definition, Biological importance, Classification, Qualitative tests, Diagnostics tests, Vitamins and Minerals,

D) Basics of Pathology:

Introduction to Pathology in brief, Preparation of Reagents, procedure and principle of tests, Body Fluids – Differential count of Peritoneal, pericardial, pleural fluids and CSF, charging chamber, Identifying and counting the cells.

E) Basics of Microbiology:

Introduction to Microbiology in brief, Microscopy, Sterilization and disinfection – classification and Methods of sterilization, Principle and Methods of sterilization by heat, Cleaning, drying & Sterilization of Glassware disposal of contaminated material i.e. clinical infective material inoculated culture media. Handling and Disposal of Biomedical waste, Morphology and classification of Bacteria.

F) Hospital Awareness:

A brief idea of hospital as an organization management different units of a hospital effective communication skills, communication channel

Familiarization of different tables/tubes in surgical department, Surgical Awareness, preparation of patient for surgery, Patient related services.



G) Communication & Computer Skills, Audio and Visual Aids:

Process & Types of communication, Strategies for effective Communication, Barriers of communication, Presentation with the use of visual aids such as power point, Conversation, Extempore speech, usage of effective language for communication of health work, Case studies and situational analysis, Survey and Reporting, Computer basic-MS – Office, Word, Excel, Power Point, Internet Concepts- Browsing, Down- Loading, Use of Slide Projector

H) Basic Electro Cardiogram (ECG):

History of ECG, ECG Equipment details.

Basic concepts ECG Machine: Parts of ECG machine, Recording the ECG and lead placement, Interpretation of ECG, Pitfalls in taking ECGs Interpretation of normal ECG, Rate & regularity, Rhythm, Voltage, P,Q,R,S,T, and U waves, Cardiac Electrical Activity, Cardiac impulse formation & Conduction, Recording of long axis cardiac electrical activity, Recording short axis cardiac electrical activity. Recording the Electrocardiogram, Evolution of frontal plane leads, Transverse plane leads, Correct & Incorrect leads placement, Electrocardiography leads placement, Display of 12 standard electrocardiogram leads. Bipolar lead (Enthovan triangle) and The 12 Lead, System, Principles of AC and DC, Types of Batteries, Ohm's Law, Watt, Joule. Ampere, ST segment and MI P wave, Risk factors for MI and heart diseases, Assessment of arrhythmias, Important cardiac diseases and its pattern. The fundamental of ECG and electricity, Safety measures, Operation and maintenance of

E.C.G. machines, Identification of the basic defects and repair, Safety Standards of E.C.G.

I) Cardiovascular System Anatomy, Physiology & Pathology:

Anatomy of Circulatory System- Size of the Heart, Position, Layers of heart, Chambers & Valves of heart, Cardiac Muscles, Blood Supply, Nerve Supply, The blood Vessels, General Plan of Circulation, Pulmonary Circulation. Name of the arteries & veins, Their position with special emphasis on Coronary Circulation Position of heart, Conduction system of heart, Cardiac cycle, Heart sound, Stroke volume, Cardiac Output, Blood Pressure and its measurement. Cardiovascular disorders in general, Understand common pathological terms & terminologies used in description of heart disease and where applicable, associated electrocardiographic features.

J) Clinical Pharmacology:

Pharmacology Related to Cardiac Technology, Anti-anginal agents, Anti-failure agents, Anti-hypertensive drugs, Anti- arrhythmic agents, Antithrombotic agents, Lipid lowering and anti-atherosclerotic drugs,

K) Basics of other Cardiovascular measurement techniques

A) Defibrillator-indications & Operations, Contra indications, Precautions, Complications and treatment.

B) Stress E.C.G. - Protocols, Procedure, Indications

C) TMT & Holter Recording-Recording and Analysis.

D) Cardiac Monitor

E) Instrumentation Study, Instrument Measurement & Critical Care equipment, ECHO, Computerized monitoring arrangement in ICCU and ICU

F) Operation, calibration, and servicing of E.C.G. machines.

G)E.C.G. Recording –in Adult & Pediatric Patients.

PAPER 5: EEG TECHNICIAN (35/25)

Basic:

Study of General Anatomy and physiology of Human Body

CLINICAL:

Normal EEG pattern in children and adult an awake and sleep.

- Neonatal EEG pattern •
- Normal variants of EEG •
- Seizure disorder
- Artefacts: Eye movements.
- Activation methods: Hyperventilation, photic stimulation, sleep deprivation.
- Abnormal EEG record.
- Abnormal EEG in neurological diseases
- Brain death

TECHNICAL ASPECTS:

- Different parts of EEG machine and its functions.
- Electroencephalographic monitoring (in patients and ambulatory), video Electroencephalography, intraoperative record, Quantitative Electrophotography Brain mapping (in brief)
- Electroencephalographer's reporting
- Record keeping.

• NEURO-ANATOMY:

Muscle: Origin, insertion, nerve supply, Course of cranial and peripheral nerves

NEURO PHYSIOLOGY: Muscle:

- (i) Functions of muscles
- (ii) Musclecontractbns
- (iii) Electrical properties of muscles

Nerve:

- (i) Functions of nerve
- (ii) Electrical properties of nerves
- (iii) Neuromuscular junction and neurotransmitters

NEURO PATHOLOGY:

Muscle: Pathological changes in muscles

- (i) Primary muscle disease
- (ii) Injury
- (iii) Metabolic
- (iv) inflammatory
- (v) Others
- (vi) Neurogenic muscle involvement
- (vii) Neuromuscular junction abnormalities

Nerve:

- (i) Demyelination
- (ii) Axonopathy

CLINICAL:**Nerve:**

- (a) Disease affecting cranial and peripheral nerves
- (b) Bells palsy
- (c) Peripheral neuropathy
- (d) Entrapment neuropathy
- (e) Basic principles of nerve conduction study (NCS)
 - (i) Motor NCS
 - (ii) Sensory NCS
 - (iii) F-wave
 - (iv) H-reflex
 - (v) Blink reflex and others
 - (vi) Repetitive nerve stimulation
 - (vii) Abnormalities in disease
 - (viii) Central motor conduction

Muscle:

- (a) Disease of muscle and neuromuscular junctions
- (b) Normal EMG recording-Resting / insertional activity/volitional recruitment pattern, interference pattern
- (c) Abnormal EMG
 - (i) Myopathies
 - (ii) Neurogenic muscle involvement
 - (iii) involuntary muscle contractions
 - (iv) Neuromuscular transmission disorder
- (d) Needle EMG- conventional, Macro EMG, surface EMG, single fibre EMG 3 Evoked potential studies:

Evoked potential studies:

- (i) Visual evoked potential
- (ii) Brainstem auditory evoked potential
- (iii) Somato -sensory evoked potential

Instruments:

- (i) Basic knowledge about the machines
- (ii) Electrodes
- (iii) Electrodes impedance
- (iv) identification of wave pattern
- (v) Artefacts
- (vi) Normal laboratory values
- (vii) Electromyography reporting
- (viii) Record keeping



PAPER 6 : FIELD PUBLICITY ASSISTANT (36/25)

- Safety rules and safety signs, Types and working of fire extinguishers. Basic electrical Symbol.
- Fundamentals of electricity, definitions, units & effects of electric current. Conductors and insulators. Conducting materials and their comparison.
- Joints in electrical conductors. Techniques of soldering. Types of solders and flux
- Ohm's Law; Simple electrical circuits and problems. Kirchhoff's Laws and applications.
- Series and parallel circuits. Open and short circuits in series and parallel networks.
- Laws of Resistance and various types of resistors. Wheatstone bridge; principle and its applications. Effect of variation of temperature on resistance. Different methods of measuring the values of resistance. Series and parallel combinations of resistors.
- Magnetic terms, magnetic materials and properties of magnet. Principles and laws of electro-magnetism. Self and mutually induced EMFs.
- Electrostatics: Capacitor- Different types, functions, grouping and uses. Inductive and capacitive reactance, their effect on AC circuit and related vector concepts. Comparison and Advantages of DC and AC systems. Related terms frequency, Instantaneous value, R.M.S. value Average value, Peak factor, form factor, power factor and Impedance etc.
- Sine wave, phase and phase difference. Active and Reactive power. Single Phase and three-phase system. Problems on A.C. circuits.
- Chemical effect of electric current and Laws of electrolysis. Explanation of Anodes and cathodes. Types of cells, advantages / disadvantages and their applications.
- Lead acid cell; Principle of operation and components. Types of battery charging, Safety precautions, test equipment and maintenance. Basic principles of Electro-plating and cathodic protection.
- Grouping of cells for specified voltage and current. Principle and operation of solar cell
- Types of domestic and industrial wirings. Study of wiring accessories e.g. switches, fuses, relays, MCB, ELCB, MCCB
- Importance of Earthing. Plate earthing and pipe earthing methods.
- Resistors—colour code, types and characteristics. Active and passive components. Atomic structure and semiconductor theory.
- P-N junction, classification, specifications, biasing and characteristics of diodes.
- Rectifier circuit - half wave, full wave, bridge rectifiers and filters. Principle of operation, types, characteristics and various configuration of transistor. Application of transistor as a switch, voltage regulator and amplifier.
- Basic concept of power electronics devices. IC voltage regulators Digital Electronics - Binary numbers, logic gates and combinational circuits.
- Working principle and uses of oscilloscope. Construction and working of SCR, DIAC, TRIAC and IGBT
- Modulation, types of modulation-A.M., F.M., P.M. & application. Broadcasting, Bandwidth mod index. Definition and importance of demodulation.
- Radio Receiver, Super heterodyne principle of 'frequency changing' Radio chain, term used in Radio transmission-specification.
- Basic of audio stage, type of amplification, driver stage, output stage, transistor use, tone



control, volume control.

- Ionosphere, Ground wave propagations, electromagnetic wave, reflection, speed of transmission, wavelength, explanation of frequency ranges, image frequency, acceptor circuit, and rejector circuit, disadvantage of R.F. amplification. Sensitivity and selectivity, fidelity. Signal to noise ratio, block diagram of Radio Receiver.

R

PAPER 7 : HEALTH ASSISTANT (38/25)

I. COMMUNITY MEDICINE

SI No	Topic
a	Trauma system-components - Injury prevention - Pre hospital care - Emergency department care - Inter facility Transportation - Trauma critical care
b	Personal Safety
c	Civil disturbances
e	Mass casualty

II. HUMAN ANATOMY

SI No	Topic
a	Upper Limb
b	Organs of abdomen - Liver - Spleen - Kidneys
c	Pelvic organs and their support
d	Lower Limb
e	Urogenital system

III. PHYSIOLOGY

SI No	Topic
a	Fluid & electrolytes - Distribution of body fluid - Composition of body fluid Disturbances in body fluids and electrolytes
b	Circulatory System - Physiological Anatomy of CVS - Cardiac cycle, heart rate, heart sound, ECG - Cardiac output, venous return - Blood pressure: Definition, Normal Value, Regulation of blood pressure Shock: Definition & Different types
c	Respiratory System - Physiological anatomy of respiratory system - Mechanism of respiration - Composition of air and transport of gases - Regulation of respiration (neural and chemical) Applied-hypoxia and airway obstruction
d	Blood - Blood: Composition and Functions - Blood Formation, fate of RBC & jaundice and Anemia - Blood Group-Types, their importance & Rh incompatibility - Hemostasis - Immunity and AIDS



e	Temperature regulation - Normal body temperature-core & oral - Heat production & heat loss - Regulating mechanism-role of hypothalamus Applied-fever, Hypothermia and heat stroke
---	---

IV. PHARMACOLOGY

SL NO.	TOPIC
a.	Introduction of the subject, Routes of administration
b.	Analgesics

V. MICROBIOLOGY

SL NO.	TOPIC
a.	Introduction to infectious disease - Introduction - Causes of infectious disease - Mode of transmission of infectious disease - Defense against infectious disease Prevention from infectious disease
b.	Blood borne pathogen - Introduction - Person at risk - Pathogens - HBV - HCV - HIV
c.	Biomedical Waste Management - Introduction - Definition of biomedical waste - Quantum of waste that is generated by a hospital - Hazards of biomedical waste - Person at risk of the hazard of medical procedures - Rules and Regulation governing the disposal of biomedical Waste - Responsibilities of health care institutions regarding biomedical waste management - Categories of waste generated in hospital and their management - Color codes and type of container used for disposal of biomedical waste - Disposal of infectious waste - Disposal of sharp - Storage of bio medical waste in hospital - Recyclable Waste
d.	- Sterilization and Disinfection - Introduction - Definition - Physical method to achieve sterilization and disinfection - Properties of disinfectants - Classification of disinfectants - Chlorine as high-level disinfectants - Preparation of working solution of sodium hypochlorite - Sterilization of common hospital instruments - Common precaution for disinfection

82

VI. ANAESTHESIA

SL NO	TOPIC
a	IV Fluids-Crystalloids and colloids
b	Blood transfusion and colloids
c	CPR including techniques and devices
d	Drowning

VII. OBSTETRICS & GYNAECOLOGY

SL NO	TOPIC
a	Anatomy and physiology of female reproductive tract - Reproductive Organs
b	Normal Pregnancy - Onset and three stages of labor - Conduct of Delivery - Steps of conduct of normal delivery - Video presentation on conduct of normal delivery - Preterm labor and premature rupture of membranes (PROM) Special consideration. How the management differs from normal labor
c	Bleeding during pregnancy - Abortions - Abruptio placenta - Rupture uterus
d	Management of delivered women - Care of mothers and new born baby - Post partum hemorrhage

VIII. SURGERY

SL NO	TOPIC
a	Golden Hour - Airway management - Control of excessive bleeding - Initial management of shock
b	Shock - Hypovolemic shock - Burn shock
c	Head injury - Pupil size and reaction of light
d	Musculoskeletal trauma: - Initial management and # immobilization - Major arterial hemorrhage - Compartment syndrome
e	Abdominal and pelvic trauma - Anatomy of abdomen Solid organ in abdominal cavity
f	Thermometer, stethoscope, BP instrument, oro-pharyngeal airway
g	Measurement of Blood Pressure
h	Station machine, suction catheter
i	Medical gas cylinder, syringe and infusion pumps



PAPER 8: LIBRARY AND INFORMATION SCIENCE (40/25)

1. Role of Libraries

Library as a social/Information institution.

Role of Library and Information centres in modern society.

Five laws of Library Science.

2. Types of Libraries, Professional Association and Organizations

National Library of India: Concept function and services.

Public Libraries, Academic Libraries and Special Libraries.

Professional Association: ILA, IASLIC, CILIP, ALA, ASLIB, SLA

National and International Organizations: RRRLE, UNESCO, IFLA Digital Libraries.

3. Library Legislation

Library Legislation: Need, Purpose, Objectives and Model Library Act.

Library Legislation in India: Structure and Silent features.

Press and Registration Act, Delivery of Book (Public Libraries) Act.

4. Information and Communication

Information: Characteristic, Nature, value and Use of Information.

Conceptual Differences between Data, Information and Knowledge.

Communication Channels, Models and Barriers.

National Knowledge Commission and Information Policy.

Information Intermediaries.

5. Library and Information Profession

Professional Skill and Competencies, Librarian as a Profession.

Ethic Issues in Librarianship.

Role of Library and Information Professional in Digital Era.

6. Element of Library Classification

Concept Terminology, Need Purpose and Function.

Species of Classification Schemes.

7. Approaches to Library Classification

Postulation approach and System Approach.

Fundamental Categories, Facet Analysis and Facet Sequence.

Phase Relation and Common Isolates.

Devices in Library Classification

8. Notation and Construction of Classification Numbers

Notation: Need, Purpose, Types and Qualities.

Call Number: Class Number, Book Number and Collection Number Construction of Class Numbers



9. General and Special Classification Schemes

Dewey Decimal Classification (DDC), Universal Decimal Classification (UDC), Colon Classification and Current trend in Library Classification.

10. Fundamental Concept and Historical Development

Library Catalogue: Definition, Objective, Purpose and Function.

History and Development of Library Catalogue Codes.

Physical forms of Catalogue and type of Catalogue.

11. Type of Catalogue Entries

Kind of Entries. Data Entries in different type of Entries.

Filling of Entries in Classified and Alphabetical Catalogues.

12. Choice and Rendering of Heading

Personal Authors: Western and Indic Names.

Corporate Authors, Pseudonymous, Anonymous work and Uniform title, Non print resources.

13. Subject Cataloguing

Subject Cataloguing: Concept, Purpose and Problems.

Chain Indexing

Subject Heading List: LCSH, SHSH

14. Trends in Library Cataloguing

Centralized and Cooperative Cataloguing.

Bibliographic Standards: ISBD, MARC, CCF etc.

ISBN and ISSN.

15. Fundamental Concepts

Meaning, Definition, Importance, Nature and Characteristics.

Printed and Electronic Information Sources.

Type of Information Sources and Services.

Criteria for Evaluation of Reference Sources.

16. xvi. Sources of Information

Primary information sources: General introduction (periodicals, conference, Patents, Standards, thesis/dissertation, trade literature etc)

Secondary information sources: Dictionaries, Encyclopaedias, Bibliographical, Geographical, Bibliographies, Indexing and Abstracting, Newspaper Indexes and Digests, Statistics, handbooks and manuals.

Tertiary information sources: Directories, Yearbooks, Almanacs, Bibliography of Bibliographies and union catalogues.



17. Reference and Information Services

Users and their information needs.

Theory and function of reference and information service, Enquire Techniques. Role of reference librarian and information officer in Electronic Environment. Marketing information Services.

18. Types of Information Services

Documentation services: Abstracting and Indexing services. Alerting services, CAS, SDI, Reprographic service, Translation service, Document Delivery and Referral service, Information services: An overview, Types of Referrals, CAS, etc.

19. Information Literacy Programme

Concepts, Objectives, Initiation of Users, User Studies.

Users and their Information needs: Categories of users, Ascertaining users' information needs and information literacy products.

Marketing of Information Services.

20. Principles of library management

Management vs. Administration, General Principles and their application, Library organisation structure and structure and Library Governance.

Library planning: Need, objectives and procedures, Basics of total quality management.

21. Financial and Human Resources

Library finance and Sources of finance, Library budget, Budgeting and Accounting. Human Resource Management: Selection, Recruitment, Training Development, Performance Appraisal.

22. Library building and Resource management

Library building, Collection Development, Acquisition of Periodicals and serials, Technical processing of documents.

23. Services and maintenance of the library

Circulation work, Maintenance shelving and stock verification, Preservation, Library services, Reference and information services.

24. Library Records and Statistics

Staff manual, Library statistic, Library Reports.

25. Introduction to Computers

Computers: Generation, types, Input and Output Devices, Computer Architecture, Data



representation and storage.

Introduction to system software and Application Software.

Operating system: DOS, Windows XP, Vista, Windows NT, Linux etc.

Word Processing, Spreadsheet, Power point presentation. Graphic Software: Basic function and potential uses, Communication software.

26. Library Automation

Library Automation: An introduction, Planning and implementation, Automation the Library, Library Automation Process/Package.

KOHA Software operating System and cloud base operating system.

In-House Operations: Acquisition, Cataloguing, Circulation, Serial Control, OPAC etc.
Bibliographic Standards: CCF and MARC 21.

Introduction to Metadata: Types of metadata Dublin Core.

Library Software Packages: Overview and House Keeping Operations.

Case Studies: WINISIS, Alice for window and SOUL.

27. Database Management System

Database: Concept and Components, Database Structure, File Organization and Physical Design.

Database Management System: Basic function, Potential uses.

28. Web Interface to WINISIS database

Introduction to Web Interface to WINISIS.

Introduction to web services: Apache server and Internet Information Server. Web Interface Software: GENESIS.

29. Introduction to Internet

Basic of Internet, Search Engines and Meta search Engine, Internet search Techniques.

E-resources and online Database.



PAPER 9: OPERATION THEATER TECHNICIAN (41/25)

1. Basic Science:-

Anatomy: Introduction to Anatomy, Basic Anatomical terminology, Osteology, Thorax, Lungs, Heart, Skeleto-muscular system, Excretory system,

Physiology: The Cell, The Blood, Cardio-Vascular System, Respiratory system, Excretory system, Reproductive system, Central Nervous system, Digestive system

Biochemistry: Carbohydrates, Proteins, Lipids, Enzymes, Vitamins & Minerals, Acids and bases.

Pathology: Cellular adaptation, Cell injury & cell death. Introduction to pathology, Mechanisms of cell injury, Reversible and irreversible cell injury. Inflammation, General features of inflammation, Historical highlights, Acute inflammation, Chemical mediators of inflammation, Summary of acute inflammation Chronic inflammation, Immunity disorders, Disorders of the immune system, Infectious diseases, General principles of microbial pathogenesis, Viral infections, Bacterial infections, Rheumatic heart disease, Fungal infections, Parasitic infections, Neoplasia- Definitions, Nomenclature, Biology of tumor growth benign and malignant neoplasms, Epidemiology, Carcinogenic agents and their cellular interactions, Environmental and nutritional disorders, Common environmental and occupational exposures, Nutrition and disease, Coronary artery disease.

2. Applied Anatomy and Physiology Related to Anaesthesia:

Structure and function of the respiratory tract in relation to respiratory system, Nose - Role in humidification, Pharynx - Obstruction in airways, Larynx - Movement of vocal cords, Cord palsies, Trachea & Bronchial tree - vessels, nerve supply, respiratory tract, reflexes, bronchospasm, Alveoli - Layers, Surfactants, Respiratory Physiology, Pulmonary Gas Exchange And Acid Base Status, Oxygen: properties, storage, supply, hypoxia, Respiratory failure, type, clinical features, causes, Chambers of the heart, major vasculature, Coronary supply, innervations, Conduction system. Cardiac output - determinants, heart rate, preload, after load. Coronary blood flow & myocardial oxygen supply ECG - arrhythmias cardiovascular response to anesthetic & surgical procedures. Hypotension - causes, effects, management, Cardio pulmonary resuscitation, Myocardial infarction, hypertension, fluids and electrolytes, blood transfusion,

3. Clinical Pharmacology:

Antisialogogues, Sedatives & Anxiolytics, Narcotics, Antiemetics, Induction agent, Muscle relaxants, Inhalational gases, Reversal agents, Local anaesthetics, Emergency drugs

4. Sterilization Procedures/CSSD Procedures:

Waste disposal collection of used items from user area, reception protective clothing and



disinfections, safety guards, use of disinfectants, sorting and classification of equipment for cleaning purposes, sharps, blunt lighted etc, contaminated high risk baby care - delicate instruments or hot care instruments, cleaning process, Materials used for wrapping and packing assembling pack contents. Types of packs prepared, Inclusion of trays and gilliparts in packs. Method of wrapping and making use of indications to show that a pack of container has been through a sterilization process date stamping, General observations principles of sterilization. Moist heat sterilization. Dry heat sterilization. EO gas sterilization. H2O2 gas plasma vapo sterilization.

5. Principles of Anesthesia:

Medical Gas Supply-Compressed gas cylinders, Colour coding, Cylinder valves, pin index, Gas piping system, Recommendations for piping system, Alarms & safety devices. Anaesthesia Machine- Hanger and yoke system, Cylinder pressure gauge, Pressure regulator, Flow meter assembly, Vapourizers - types, hazards, maintenance, filling and draining, etc. Breathing System - General considerations: humidity & heat Common components - connectors, adaptors, reservoir bags. Capnography, etc. O₂, Pulse oximetry, Methods of humidification, Classification of breathing system, Mapleson system - a b c d e f, Jackson Rees system, Bain circuit, non-rebreathing valves - ambu valves, The circle system, Components, Soda lime, indicators. Face Masks & Airway Laryngoscopes - Types, sizes, Endotracheal tubes - Types, sizes, Cuff system, Fixing, removing and inflating cuff, checking tube position complications. Anaesthesia Ventilator and Working Principles. Monitoring - ECG, SpO₂, Temperature, IBP, CVP, PA Pressure, LA Pressure.

6. Basic Anaesthetic techniques:

History Of Anaesthesia, Pre-Op Preparation- Pre anesthetic assessment, History - past history - disease / Surgery / and personal history - Smoking / alcohol General physical assessment, systemic examination - CVS, RS, CNS. Investigations- Routine - Haematological - their significance, Urine, E.C.G, Chest X - ray. Special -Endocrine, hormonal assays, Echocardiography, Angiography, Liver function test, Renal function test, Others. Case acceptance: ASA grading - I, II, III, IV. V Pre - Anaesthetic Orders- Patient - Informed consent, Npo, Premedication - advantages, drugs used, Special instructions - if any. Machine - Checking the machine O₂, N₂O, suction apparatus Laryngoscopes, et tubes, airways, Things for IV accessibility, other monitoring systems. Drugs - Emergency drugs, Anesthetic drugs Intraoperative Management - Confirm the identification of the patient, Monitoring - minimum, Noninvasive & Invasive monitoring, Induction - drugs used, Endotracheal intubation, Maintenance of anesthesia, Positioning of the patient, Blood / fluid & electrolyte balance, Reversal from anesthesia - drugs used, Transferring the patient, Recovery room - set up and things needed. Post Operative Complications & Management.

7. Regional Anaesthetic techniques:

Local anaesthetic technique, Nerve blocks, Spinal Anaesthesia, Epidural anaesthesia.

PAPER 10: PHARMACIST (ALLOPATHY) (42/25)

- **Pharmaceutics:**

Pharmacopoeia, Packaging materials, Pharmaceutical aids, Preservatives, Unit operations, Size reduction, Tablets, Capsules, Liquid oral preparations, Topical preparations, Powders and granules, Sterile formulations, Immunological products, Basic structure, layout, sections, and activities of pharmaceutical manufacturing plants Quality control and quality assurance, Novel drug delivery systems.

- **Pharmaceutical Chemistry:**

Introduction to Pharmaceutical chemistry, Sources and types of errors, Impurities in Pharmaceuticals, Volumetric analysis, Gravimetric analysis, Inorganic Pharmaceuticals- Haematinics, Gastro-intestinal Agents, Topical agents, Dental products, Medicinal gases, Drugs Acting on Central Nervous System, Drugs Acting on Autonomic Nervous System, Drugs Acting on Cardiovascular System, Diuretics, Hypoglycemic Agents, Analgesic And Anti-Inflammatory Agents, Anti-Infective Agents, Antibiotics, Anti-Neoplastic Agents

- **Pharmacognosy:**

Definition, history, present status and scope of Pharmacognosy, Classification of drugs, Quality control of crude drugs, biological source, chemical constituents and therapeutic efficacy of the following categories of crude drugs, Plant fibres used as surgical dressings, Basic principles involved in the traditional systems of medicine, Herbs as health food, Herbal cosmetics, Phytochemical investigation of drugs.

- **Human Anatomy & Physiology:**

Scope of Anatomy and Physiology Definition of various terminologies, Structure of Cell, Tissues of the human body, Osseous system, Haemopoietic system, Lymphatic system, Cardiovascular system, Respiratory system, Digestive system, Skeletal muscles, Nervous system, Sense organs, Urinary system, Endocrine system (Hormones and their functions), Reproductive system.

- **Social Pharmacy:**

Introduction to Social Pharmacy, Preventive healthcare, Nutrition and Health, Introduction to Microbiology and common microorganisms, Epidemiology, Causative agents, epidemiology and clinical presentations and Role of Pharmacists in educating the public in prevention of the following communicable diseases, Introduction to health systems and all ongoing National Health programs in India, their objectives, functioning, outcome, and the role of pharmacists, Pharmacoeconomics – Introduction, basic terminologies, importance of pharmacoeconomics.



- **Pharmacology:**

General Pharmacology, Drugs Acting on the Peripheral Nervous System, Drugs Acting on the Eye, Drugs Acting on the Central Nervous System, Drugs Acting on the Cardiovascular System, Drugs Acting on Blood and Blood Forming Organs, Drugs Acting on the Gastro Intestinal Tract, Drugs Acting on the Kidney, Hormones and Hormone Antagonists, Autocoids, Chemotherapeutic Agents, Biologicals.

- **Community Pharmacy & Management:**

Community Pharmacy Practice, Professional responsibilities of community pharmacists Introduction to the concept of Good Pharmacy Practice and SOPs, Prescription and prescription handling, Communication skills, Patient counseling, Medication Adherence, Health Screening Services in Community Pharmacy, Over The Counter (OTC) Medications, Community Pharmacy Management

- **Biochemistry & Clinical Pathology:**

Introduction to biochemistry, Carbohydrates, Proteins, Lipids, Nucleic acids, Enzymes, Vitamins, Metabolism, Minerals, Water and Electrolytes, Introduction to Biotechnology, Organ function tests, Introduction to Pathology of Blood and Urine.

- **Pharmacotherapeutics:**

Introduction, scope, and objectives. Rational use of Medicines, Evidence Based Medicine, Essential Medicines List, Standard Treatment Guidelines (STGs), Definition, etiopathogenesis, clinical manifestations, nonpharmacological and pharmacological management of the diseases.

- **Hospital & Clinical Pharmacy:**

Hospital Pharmacy Definition, scope, national and international scenario, Organisational structure, Professional responsibilities, Qualification and experience, requirements, job specifications, work load requirements and inter professional relationships, Good Pharmacy Practice (GPP) in hospital, Hospital Pharmacy Standards (FIP Basel Statements, AHSP) Introduction to NAQS guidelines and NABH Accreditation and Role of Pharmacists, Different Committees in the Hospital, Supply Chain and Inventory Control, Drug distribution, Compounding in Hospitals. Bulk compounding, IV admixture services and incompatibilities, Total parenteral nutrition, Radio Pharmaceuticals, Application of computers in Hospital Pharmacy Practice, Electronic health records, Softwares used in hospital pharmacy, Clinical Pharmacy: Definition, scope, and development - in India and other countries, Technical definitions, common terminologies used in clinical settings and their significance such as Paediatrics, Geriatric, Anti-natal Care, Post-natal Care, etc., Daily activities of clinical pharmacists, Pharmaceutical care, Medication Therapy Management, Home Medication Review, Clinical laboratory tests used in the evaluation of disease states, Poisoning, Pharmacovigilance, Medication errors, Drug Interactions.

Pharmacy Law & Ethics:

General Principles of Law, History and various Acts related to Drugs and Pharmacy profession, Pharmacy Act-1948 and Rules, Pharmacy Practice Regulations 2015, Drugs and Cosmetics Act 1940 and Rules 1945 and New Amendments, Manufacture of drugs, Study of schedule C and C1, G, H, H1, K, P, M, N, and X, Sale of Drugs, Administration of the Act and Rules, Narcotic Drugs and Psychotropic Substances Act 1985 and Rules, Drugs and Magic Remedies (Objectionable Advertisements) Act 1954, Drugs and Magic Remedies (Objectionable Advertisements) Act 1954, Poisons Act-1919, FSSAI (Food Safety and Standards Authority of India) Act and Rules, National Pharmaceutical Pricing Authority, Code of Pharmaceutical Ethics, Role of all the government pharma regulator bodies – Central Drugs Standards Control Organization (CDSCO), Indian Pharmacopoeia Commission (IPC), Good Regulatory practices (documentation, licenses, renewals, e-governance), Introduction to BCS system of classification, Basic concepts of Clinical Trials, ANDA, NDA, New Drug development, New Drugs and Clinical Trials Rules, 2019. Brand v/s Generic, Trade name concept, Introduction to Patent Law and Intellectual Property Rights, Emergency Use Authorization, Blood bank – basic requirements and functions, Clinical Establishment Act and Rules, Biomedical Waste Management Rules 2016, Bioethics - Basic concepts, history and principles. Brief overview of ICMR's National Ethical Guidelines for Biomedical and Health Research involving human participants, Consumer Protection Act, Disaster Management Act, Medical Devices – Categorization, basic aspects related to manufacture and sale.

h

PAPER 11: PUBLICITY ASSISTANT (43/25)

- Safety Rule and Safety Signs, Types of working of fire extinguishers.
- Fundamentals of electricity, definition, Unit and effect of electric current, Conductor and insulator, conducting materials and their comparison, technique of soldering, Type of solder and flux.
- Ohm's Law; simple electrical circuits and problems.
- Kirchhoff's Laws and applications. Series and parallel circuit, open and short circuits in series and parallel network.
- Laws of Resistance and various types of Resistors. Series and Parallel combination of Resistors.
- Magnetic terms, Magnetic materials and properties of magnet.
- Capacitors: Different types, functions, grouping and uses.
- Comparison and advantages of DC and AC system, related term, frequency, instantaneous value, R.M.S value, Average value, peak factor, form factor, power factor and impedance.
- Chemical Effect of Electric Current and law of electrolysis, explanation of anode and cathode, type of cells, advantage/disadvantage and their applications.
- Different type of wiring: Power, Control, Communication and entertainment wiring.
- Resistors-Colour code, Types and Characteristics, Active and Passive component.
- P-N Junction, Classification, Specification, Biasing and Characteristics of Diodes.
- Rectifier Circuit-Half wave, Full wave, Bridge Rectifiers and filters. Principles of operation, types, characteristics and various configuration of Transistor. Application of Transistor as switch, voltage regulator and amplifier. IC voltage regulator.
- Digital electronics: Binary number, logic gates and combinational circuits.
- Working principle and uses of oscilloscope, construction and working of SCR, DIAC, TRIAC and IGBT.



PAPER 12: RADIOGRAPHIC TECHNICIAN (44/25)

Human Anatomy:

- Anatomical positions, terms, description, basic embryology, and development.
- Musculo -skeletal system, bones, joints, types of joints, muscles, types of muscles, vertebral column, upper and lower limbs.
- Cardio-vascular system including heart, major blood vessels, arteries, veins, capillaries, lymphatics
- Respiratory system including the lungs, trachea, bronchus, bronchus-pulmonary segments, alveoli arterial supply. venous drainage. pulmonary circulation etc.
- Central Nervous system including the brain, spinal cord, central and peripheral nervous system, brachial plexus, sacral plexus, cranial nerves.
- Head and neck include the skull, external ear, middle ear, temporal bone , paranasal sinuses, pharynx, larynx, oral cavity, face, tongue, nasal cavity, eyes.
- Gastro-Intestinal tract including the Exophages, Stomach, Small Intensity – Duodenum, Jejunum, ileum, Cecum, appendix, Large intestine – Ascending, Transverse, Descending colon, Hepatic and Splenic flexures, Sigmoid colon, Rectum and anal canal.
- Hepato- Biliary system including the Liver, Gall Bladder, Biliary tree, Pancreas, Spleen.
- Genito-urinary system- - including. Kidneys, urinary Bladder, Urethra, Male and Female reproductive system including testes, prostate, seminal vesicles, uterus, cervix, fallopian tubes, ovaries, penis, vagina, vulva.
- Endocrine s y s t e m including the Endocrine glands like pituitary, Thyroid, Adrenal, parathyroid.

Basic Physiology:

- Functional organization of body structures, Musculo -skeletal system, skeletal muscles, smooth muscles, blood cells, plasma, blood groups, lymphatics.
- Physiology of cardio- vascular system including heart and circulation, blood pressure, arteries, veins, Capillaries
- Physiology of Respiration including Lungs, trachea, bronchus, bronchopulmonary segments, gas exchange.
- Physiology of excretory system including the structure and functional unit of kidneys, formation and excretion of urine, reabsorption of water, process of micturition.
- Mah and female reproductive system including the spermatozoa, oocytes, hormonal changes.
- Physiology of the hepato-biliary system including, formation and circulation of bile, Porter circulation, Porto-systemic anastomosis.
- Physiology of the Gasto-intestinal system including the process of digestion, digestive enzymes, water reabsorption, formation and excretion of stool, gastrocolic reflexes.
- function of the nervous system including autonomic nervous system, CSF, cranial nerves sensory and motor systems.



Basic Pathology:

- Basic pathological conditions, cellular structure, pathogenesis of disease, inflammation, types and definition, Degeneration, cell death, granulomatous inflammation, healing process.
- Hemodynamic disorders like hemorrhage, ischemia, infarction
- Hypersensitivity reaction, infection – bacteria, viral, parasitic, worm infestation
- Tumours, benign and malignant, common cancers affecting various system, neoplasia, metastasis, lymphadenopathy.

Radiation Physics and Protection:

- X-Ray production and properties introduction to X – Rays, history, origin, construction of X-Ray tubes. Requirements for X -Ray production (electron sources, target and anode material), tube voltage, current, space charge, cathode assembly, efficiency stationary and rotation tubes, kVp, mAs
- Common factors affecting thermionic emission, specialized types, focal spot, target angle Heat dissipation methods, tube rating, heat units, operating conditions, maintenance and quality assurance procedures.
- Image and its characteristics: Formation of radiological image, latent image, intensifying screens, factors affecting image quality, quality assurance tests. Factors affecting image quality: radiographic image contrast density, sharpness, magnification, distortion of image, noise, blur Scattered radiation. Appliances to reduce Scattered radiation, grids – stationary and moving, use of cones.
- Diaphragm, light beam device, collimation.
- X-Ray generation and circuit: Filament current and voltage, primary, circuits, auto transformers. types of exposure switch and times principle of automatic exposure control (AEC), filament circuit, high voltage circuits, half and full wave rectification, three phase circuit. Types of generators, 3 phase, 6 and 12 pulse circuits, falling load generation, capacitors discharge and grid control system.
- Radioactive: Structure and property of nucleus, nuclear forces, binding, energy, radioactive decay, characteristic X- Ray, charge of radionuclides, alpha, beta, positron, gamma emission, modes of decay, auger electrons, electron capture, isomeric transition, internal conversions, naturally occurring radionuclides. Interaction of X-ray with matter, types of interaction of x-rays, gamma radiation Photoelectric and Compton Bremsstrahlung pair production anhelation radiation.
- Radiation Unit Dosimetry and Dosimetry of ionizing radiation: Units of radiation, SI units ICRU definition of absorbed dose quality factor dose equivalent relationship between absorbed and equivalent dose, patient dose, occupational exposure, natural and background radiation, population exposure, Basic principles of ionization chamber, proportion counter, GM counters, scintillation.
- Detector thermoluminescent dosimeters (TLD)
- Biological effects of radiation including excitation and free radical formation, DNA, RNA and tissue radiosensitivity. Effects of ionizing radiation, nonionizing radiation, stochastic and non-

stochastic effects mean and lethal dose.

- Principles of radiation protection – time, time, distance shielding AERB Guidelines Bhabha Atomic Research Centre (BARC) Room Layout, construction and installation Quality assurance radiation leakage devices to measure radiation Principles of ALARA, radiation protection in mobile units, exposure during pregnancy 10-day rule

Radiography and Dark Room Techniques:

- Skull Radiography – including AP/Lateral view, base of skull view, radiological base line, radiography of the pituitary gland, mastoids various specialized views of skull radiography. Radiography of Para nasal sinuses (PNS), - Waters's view, townes's view, X-ray of nasal bone, TM joint. Radiography of soft tissue of neck – special consideration.
- Radiography of upper extremity, bones of joints -views techniques, Radiography of lower extremity – view techniques Special view for small joints – wrists, MCP, IP joints, tarsal bones etc.
- Chest Radiography – various views, techniques decubitus views Radiography of ribs, soft tissues Abdominal radiography – erect, supine KUB – view technique. Radiography of pelvis – views and techniques.
- Radiography of hips, pelvis – views and techniques precaution. Radiography of spine, vertebral column – views techniques Special care in vertebral injury cases. Radiography in trauma patients CV junction radiography techniques.
- Dental, Orthopantomograms. Paediatric Radiography, Mobile Radiography.
- Introduction of dark room, layout, ventilation, illumination, developer, fixer tanks. Dry bench. wet bench, pass boxes. characteristics. features and requirements of dark room. Process of developing, fixing, rinsing.
- Film material, construction of films, types of films, storage of films. Sizes Film speed, high speed, low speed. Newer film types - laser films, dry and wet laser films.
- Screens- Construction of screen, uses of screen, types of screens. High speed, low speed, low speed, care of screens, film-screen combination - advantages, technique modification in relation to speed. Principles of fluorescence and phosphorescence, rare earth screens, blue and green screens.
- Film Processing - manual, automatic film processing, washing, drying, hangers - clip hangers, channel hanger. Chemical- Developers, fixers, rinser replenisher solution etc. Advantages, disadvantages of automatic, manual processing. Film fog -definition, types of fog. causes of fog. Effect of temperature, sunlight in improper storage, old films, artifacts. Cassettes - Design, care, construction, types and mounting.
- Digital Radiography and Mammography
- Physics of films – Screen Mammography Special features of mammography equipment including tubes, grid, screen and films Equipment – tube compression technique, Automatic exposure control.
- Image Techniques and view – conventional and supplementary, grids techniques in dense breasts, compression techniques,
- Breast cancer screening, BIRAD classification, current trends in screening of breast cancer Radiation dose and screening issues – specificity and sensitivity, advantages and hazards of

screening

- Characterisation of breast lesion role of biopsy, FNA international procedure in breast Stereotactic biopsy guides attachments.
- Anatomy of Breasts and basic breast disease.
- Basic uses of digital Technology in Radiography PACS, DICOM, Cloud Computing, Filmless Radiology.
- Computerised Radiography System, Digital Radiography system Digital tomosynthesis – uses and advantages
- Multi – Format Cameras. Thermal paper printers, Laser Printers – Dry and wet laser printer

Special Radiography Procedure:

- Introduction to contrast media, oral and iv contrast agents, new generation contrast agents. Reaction to contrast agents and management of reaction to contract agents. Drugs and emergencies in radiology department including aesthesia in radiology department.
- Sialography, Myelography, Endoscopic Retrograde Cholangio Pancreatography (ERCP) Percutaneous transhepatic cholangiography (PTCA)
- T-Tube cholangiography Endoscopic Retrograde Cholangio Pancreatography (ERCP) Percutaneous transhepatic Cholangiography (PTCA)
- Barium swallow Barium meal Hypotonic duodenography Barium meal follow through and Enteroclysis, Barium enema.
- Intra Venous urography (IVU), Retrograde Urography (RGU) and Urethrogram Micturating Cysto- Urethrography (MCU) Percutaneous nephrostomy, Hysterosalpingography.
- (HSG)
- CT Scan techniques
- Basic physics, tube technology, rating, detector technology, generators, stabilizers, gantry, console etc. Data acquisition, various methods, types and generation of CT Scanners, filters, tilte Spiral CT, slip ring technology, advantages. Post processing, software, work stationImage reconstruction.
- Display parameters. Hounsfield units, values of normal tissues. Use of oral, rectal, iv contrast in CT Scan, dose consideration, administration, patient preparation. Principles of window, grey scale contrast optimization.
- Clinical application of CT scan. CT Scan techniques of brain, chest, abdomen, head and neck, etc. Recording CT images, filming techniques, cameras and archiving, digital archiving CD, DVD, MOD etc Normal CT anatomy of various organs, common pathologies. Post processing and multiplanar reconstruction.
- Multi slice CT HRCT lungs and temporal bone CT angiographic procedures, coronary angiography using CT, calcium scoring techniques, uses Pressure injectors, advantages, scan delay, principle of one arm circulation time. Special procedures like virtual endoscopies, colonoscopies, bronchoscopy, perfusion imaging techniques and clinical uses. Advantages and limitations of CT scans, artifacts, techniques to minimize artifacts.
- MRI techniques
- Basic physics, data acquisition, relaxation time, gradient, spin echo techniques Larmour

frequency equation and constant. Effect of magnetic field on cells. Magnets types of magnets, permanent magnets, superconductor magnets, field strength tesla. Close and open magnets Slice selection, RF coils, types of coils and uses. Image reconstruction, display and recording devices.

- Sequences in MRI, basic sequences, T1, T2 weighted images, newer sequences IV contrast agents in MRI
- Applications of MRI in brain imaging, spine imaging, abdomen and pelvis imaging, imaging of joints head and neck.
- Special MRI procedures like MR Angiography, MRCP, Arthrography, MR enteroclysis. Functional MRI, Diffusion and Echoplanar imaging.
- MRI room design and installation. Copper shielding of MRI rooms, specifications. Effect of shielding on image quality. Safety factors precautions in MRI.
- Angiography, Ultrasound and Colour Doppler.
- Angiographic techniques in radiology Conventional angiography, setting up of cath labs, rapid sequence film techniques. DSA, Selective and Super-selective angiographies, indications, uses, techniques. Coronary angiographic techniques conventional CT coronary angiography, ECG gating contrast dose, automatic injectors.
- Basic physics of Ultrasound Imaging, terminology, principles Image acquisition, transducer technology, display controls, recording and archiving of USG images. Advantages and uses of Ultrasound, Coupling agents-ingredients, preparation, application.
- Routine abdominal USG, High frequency USG, M-Mode sonography, usg of small parts, testes, breasts, A-scan, B-scan, thyroid, neonatal brain. Use of USG in interventions, USG in pregnancy. fetal USG screening, Endoluminal sonography - TVS, TRS, Trans-perineal USG, colour doppler in pregnancy, Doppler evaluation of in-utero fetus. PNDT act including its aims and objectives
- Basic Principles of color Doppler, uses of color Doppler, Pulsed Doppler, Continuous wave Doppler, power angiography. Use of Doppler in non-vascular conditions. Basics of Echocardiography and use of Echocardiography including B-mode, M-Mode, Color Doppler, Continuous wave Doppler in echocardiography.



PAPER 13: SURVEYING (45/25)

1. **Lettering and Numbering:** Details layout of lettering, lines & dimensioning system.
2. **Introduction of surveying,** types of surveying, use, application principal.
3. **Scales:** Knowledge of different types of scales, determine of R.F & uses of scales.
4. Different types of projection views orthographic, sectional, isometric view.
5. Use & application of conventional signs & symbols.
6. Uses of Chain/ tape, testing of a chain & correction. Ranging (direct & indirect), Principle of chain survey, application. Terms used in chain survey, **Offset** - types of offsets, limit of offset, **field book**- types of field book, entry of field book method of chaining in slopping ground. Field procedure of chain survey errors in chain survey, plotting procedure. Calculation of area (regular & irregular figure), Knowledge of site plan.
7. Basic terms used in compass survey. Instrument & setting up. Conversion of bearing web to R.B. Calculation of included angle from bearing local attraction, magnetic declination and true bearing, closing error. Adjustment of closing error, precaution in using prismatic compass.
8. **Plane table survey,** principle, merits & demerits, Instrument used in plane table, survey setting up the plane table. (centering, levelling, orientation), Methods of plane table survey (radiation, intersection, resection, traversing), Error in plane table survey.
9. **Introduction to Theodolite.** Types of Theodolite, parts of Theodolite, Terms used in Theodolite survey. Temporary adjustment of Theodolite, Angle measurement process. Reading of angles, field book entry of measured angles. Permanent adjustment of Theodolite. Traversing using theodolite (closed & open), traverse computation, determination of consecutive coordinates, independent coordinates, checking & balancing of traverse, preparation of gales, traverse table, computation of area using co-ordinates, calculation of omitted measurement
10. **Introduction to levelling-** Types of levelling instrument. Technical terms used in levelling Temporary & permanent adjustment. Different types of levelling Entry of level book. (Reduced level calculation method) Curvature & refraction effect sensitivity of bubble tube. Common error and their elimination. Degree of accuracy.
11. **Introduction of tachometry** & terms use advantages and disadvantages. Tachometric constants & its determination. Determination of horizontal & vertical distances by various methods.
12. **Contouring,** contour interval selection of contour interval, characteristics of contour, uses of contour contouring by various method. Interpolation of contour by various methods, drawing of contours, computation of volume establishment of gradient by abney level.
13. **Curves,** Purpose, Types of curves – simple, compound, reverse, transition, vertical. Elements of simple curve, computation of elements of simple curve. Various methods for setting out simple, compound, reverse, transition & vertical curve.
14. Familiarization with modern survey instruments. Parts of Total station, temporary adjustment of T.S, working procedure of T.S.
15. Familiarisation with cadastral map, term used in cadastral survey, preliminary knowledge for prepare a site plan. Calculation of area by digital planimeter.
16. Types of surveys for location of a road. Points to be considered during reconnaissance survey. Classification of roads and terms used in road engineering, alignment of roads relative

importance of length of road, height of embankment depth of cutting & filling, road gradients super elevation etc.

17. Knowledge for preparation of topographical map. Knowledge for preparation of cadastral map. Knowledge for preparation of a road project.
18. Importance of cartographic projection. Uses of various types of cartographic projection for mapping.
19. Introduction of GIS& GPS. Elements of GPS/DGPS. Observation principles. Sources of error & handling of error in GPS. Various type of GPS application. Concept & use of survey software.
20. Introduction to hydrographic survey, practice various methods of water depth measurement process, flow velocity measurement & determination of cross-sectional area of a river. Handling of echo sounder, current meter.
21. Basic terms used in transmission line survey, justification criteria for constructing new line, marking process of tentative alignment, selection process of a good alignment. Process of detail survey & final location survey. Use of sag template, Various type of tower, construction of tower foundation.
22. Basic terms used in railway line project survey, justification criteria for constructing new line, marking process of tentative alignment, selection process of a good alignment. Process of detail survey & final location survey.
23. Specification & uses of various types of building materials, types of foundation, knowledge of R.C.C. works, & other construction related items. Procedure of prepare a detail estimate.
24. Basic knowledge of Auto CAD

*** END ***

h