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# Guidelines, Protocols & Standards for National Medical College Network (NMCN)

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# 1. INTRODUCTION

- **1.1** National Knowledge Commission (a Government of India Initiative) has provided High Speed Bandwidth connectivity to all educational institutions in the country, including Government medical colleges in the Public Health Sector.
- **1.2** A Centrally Sponsored Scheme (CSS) scheme amounting to Rs. 103.99 Crore was approved in Feb' 2014 and under this scheme a National-cum-Regional Resource Centre, five Regional Resource Centres and 35 other Medical Colleges having connectivity provided by National Knowledge Network (NKN) are to be networked in the First Phase for the purpose of Tele-education, Tele-CME, Tele-consultation, and creation of Digital Library etc.

As a part of the first Phase of NMCN project, following institutions are identified as the Resource Centres:

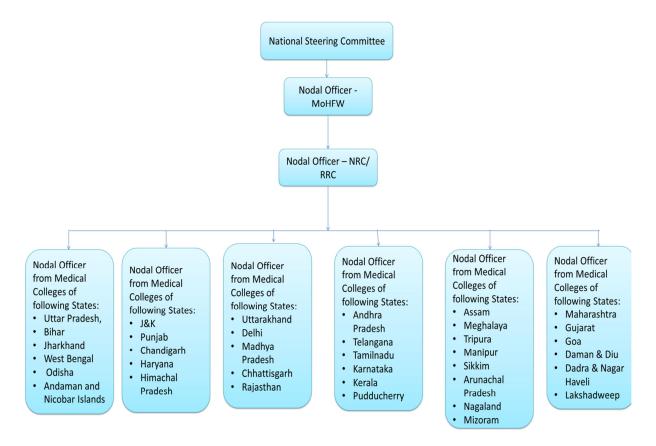
S. No.	Region	Medical College
1	National Resource Centre	SGPGI, Lucknow, UP
II	Regional Resource Centres	
	Northern Region	PGIMER, Chandigarh
ii	Southern Region	JIPMER, Pondicherry
iii	Eastern Region	SGPGI, Lucknow, UP
iv	Western Region	KEM Medical College &
		Hospital, Mumbai,
		Maharashtra
V	Central Region	AIIMS, New Delhi
vi	North-eastern Region	NEIGRIHMS, Shillong,
1		Meghalaya

#### 2. IMPLEMENATATION FRAMEWORK

# 2.1 <u>Institutional setup for implementation</u>

A National Steering Committee constituted under the chairmanship of Secretary (Health & Family Welfare) shall be the apex body for implementation of NMCN and other schemes to:

- Review of the Project periodically every six month
- Approval/ Sanction of the recommendation made by the groups
- Allocation of the budget for the sustenance of the project recommended by National Working Group



# 2.2 National Resource Center (NRC)

Responsibilities of the National Resource Center (NRC) shall be as follows:

- i. Assist MOHFW in all matters relating to Telemedicine Program management at national level
- ii. Oversee the implementation of NMCN scheme in close coordination with RRCs and Medical Colleges (MC)
- iii. Engage in research and development to define standards, policy, strategy, system and product development, define practice protocol, evaluate system and operation
- iv. Establish infrastructure and resources to carry out education and training programmes in telemedicine and all sectors of Health IT / eHealth/ Tele-health etc.
- v. Engage with international development agencies through MOHFW to showcase Indian strength in developing indigenous technology and system in the field of telemedicine.
- vi. Maintain national portal of NMCN Project including national resource for CME content and manage the distributed network over private NMCN Cloud
- vii. Any other responsibilities assigned by MOHFW time to time.

# 2.3 Regional Resource Centres (RRCs)

Responsibilities of Regional Resource Centres (RRCs) shall be as follows:

- i. To oversee the implementation of NMCN scheme in close coordination with Medical Colleges (MC).
- ii. Supervision of tele-health and tele-educational activities in the region under its jurisdiction.
- iii. Innovate practice models ensure it's sharing.
- iv. Conducting regular face to face workshop in each State alternately and over videoconference with all partner nodes at least once every month
- v. Co-ordinate with all telemedicine projects being undertaken in the region e.g. Tele-ophthalmology, Tele-oncology etc.

Any other responsibilities assigned by MOHFW time to time.

#### 2.4 <u>Telemedicine Committee</u>

A "Telemedicine Committee" will be created in National Resource Center (NRC), Regional Resource Centre (RRC) and in every Medical College with the Nodal Officer being the convener to carry out the Telemedicine activities in Resource Centres.

# 3. Human Resource under NMCN

- Each Resource Centre shall engage its own manpower for planning organizing and executing its programmes. Such manpower shall be employees of the parent institution as the case may be, and not employees of the Government of India.
- The role of the Government of India is strictly limited to providing financial assistance as per the approved financial pattern.
- The resource (human, physical and financial) of the Resource Centre shall be utilized for the
  purpose of Resource Centre only. Utilization of services of the members of staff of Resource
  Centre by the parent organization, use of Resource Centre vehicle for other purposes and
  other transgressions shall be treated as serious violations of these guidelines.
- 3.2 List of approved Human resource in NRC and RRCs under NMCN project is available at Annexure: I

# 3.3 Responsibilities of Nodal Officers at NRC

- To act as the single point of contact for RRCs, Implementation Agency and MoHFW for implementation of NMCN scheme
- Responsible to oversee the implementation and operations of NMCN scheme in collaboration with Implementation Agency (IA) and RRC
- Provide administrative guidance and approvals for staff of Implementation Agency (IA) to work in the premises
- Prepare the performance report of the staff
- Provide administrative approval on invoice as per contract of IA with MoHFW
- Preparation of Schedule & coordination with the medical specialty doctors for tele-health and educational services.
- Supervision of log book entry of daily events in a prescribed format common for the pilot project.
- Compilation, Analysis and Preparation of the program audit report and submission to the hospital manager on monthly basis.
- Daily supervision of the telemedicine center and assisting the technical staff in proper up keeping of the infrastructure.
- Conducting telemedicine awareness program/ workshop among medical nursing, paramedical staff of the hospital.
- Knowledge of the infrastructure at all ends
- Have communication skill to make report with the medical & technical staff of both sides & should have contact details
- Familiarity with equipment, network and related technical terms
- Aware of the working schedules of the health centre workers at both ends and the holiday information

## 3.4 Responsibilities of Nodal Officers at RRC

- To act as the single point of contact for NRC, Implementation Agency and MoHFW for implementation of NMCN scheme
- Responsible to oversee the implementation and operations of NMCN scheme in collaboration with Implementation Agency (IA) and NRC
- Provide administrative guidance and approvals for staff of Implementation Agency (IA) to work in the premises
- Prepare the performance report of the staff
- Provide administrative approval on invoice as per contract of IA with MoHFW
- Monthly review of log book record
- Identification and rectifications of issues related to human and technical factors
- Periodic meeting with program management staff and clinical telemedicine users
- Audit of the Telemedicine usage every three months and preparation of impact analysis report
- Planning, Sustenance of the project and budget allocation
- Submission of Report to Nodal Officer Ministry of Health & Family

• Participation in telemedicine national level meeting to share the experience, benefits and problems managing the telemedicine program.

# 3.5 Responsibilities of Nodal Officers at Medical Colleges

- Responsible to oversee the implementation and operations of NMCN scheme in collaboration with Implementation Agency (IA), RRC and NRC
- Provide administrative guidance and approvals for staff of Implementation Agency (IA) to work in the premises
- Prepare the performance report of the staff
- provide administrative approval on invoice as per contract of IA with MoHFW
- Monthly review of log book record
- Identification and rectifications of issues related to human and technical factors.
- Periodic meeting with program management staff and clinical telemedicine users.
- Audit of the Telemedicine usage every three months and preparation of impact analysis report.
- Planning, Sustenance of the project and the budget allocation.
- Submission of Report to Nodal Officer Ministry of Health & Family
- Participation in telemedicine national level meeting to share the experience, benefits and problems managing the telemedicine program.

#### 4. Standard Operating Protocols (SoPs)

#### 4.1 Protocol for the Telemedicine Technician at Medical College

- Check the functionality of all components of the Telemedicine platform and network every day in the morning and keep the system in readiness
- Carry out a check video-conference with Telemedicine Unit
- Record patient consent in the prescribed "Consent Form" and get the signatures of patient and accompanying person as Witness. Explain the patient and witness if they have any concern and make them comfortable with the technology and process
- Enter the medical information of the patient needing tele-consultation in the telemedicine software (Take assistance of the doctor if needed). Attach the medical diagnostic results with the EMR in the appropriate field provided in the telemedicine software.
- Transmit the Electronic Medical Record (EMR) on-line to Telemedicine Unit prior to scheduled tele-consultation time and confirm the receipt telephonically, inform the same to the doctor.
- Store the EMR in the system.
- Co-ordinate with Telemedicine Technician at consulting center telephonically, to start the video-conference when the Consultant arrives at scheduled time and ensure presence of the patient and doctor (seeking tele-consultation) to take part in the interactive video conference.
- Ensure utmost privacy and presence of a Female Nurse in case of female patient

- At the end of the telemedicine session, assist the doctor in preparation of electronic prescription and issue a print out of the same to the patient after getting the signature of the doctor
- Store the e-prescription in the patient file in the system
- Maintain a log book of all sessions held and the platform/ network functional status on daily basis in the prescribed format
- Compile data on monthly basis and submit telemedicine programme manager and provide other information as desired
- Ensure availability in the Telemedicine Unit during hospital working hours and on-call during emergency tele-consultation
- Comply to security measures as prescribed by the Hospital to ensure safety of the Telemedicine Equipment
- Keep close liaison with Telemedicine Programme Manager and hospital staff involved in the Telemedicine Programme.

# 4.2 Protocol for the Doctors seeking Tele-consultation at Medical College

- Fix Patient appointment for tele-consultation with specialist as per the schedule
- To be sure, it is advisable to re-check on telephone that the Consultant of the desired specialty is available on that day for providing tele-consultation service and any change in the timing
- Explain the patient about the telemedicine tools and tele-consultation process. All possible measures to be adopted to make the patient understand all the elements before getting him/ her sign the Consent form. For the first timer it is advisable to take the patient to the Telemedicine Unit while explaining the system for better understanding
- Assist the Telemedicine Technician in preparing the EMR of the patient and attach all the diagnostic investigation results
- Ensure from the technician on satisfactory electronic transmission of the patient record file to specialist center
- Ensure utmost privacy for the patient. Make the patient comfortable during the interactive videoconference. Ensure presence of female nurse during the interactive videoconference. Ensure presence of female nurse during the session and the telemedicine technician should go out after setting up the videoconference, only to be called in case of technical problems.
- During videoconference, present the patient to the consultant with all relevant clinical information and diagnostic results, provisional diagnosis, and issues on which teleconsultation is sought. If needed the Consultant at specialist center may like to talk to the patient directly to clarify further which needs to be moderated by the Medical College/ District Hospital doctor.
- At the end of the session, make an informed decision based on the advice received from the Consultant and issue signed prescription and advisory note to the patient and keep a copy each for personal record and for the hospital telemedicine unit.
- Schedule appointment for re-visit if need be.

# 4.3 Protocol for the Specialist for delivering Tele-health Services

- Contact the Telemedicine Unit for the tele-consultation appointment scheduled for the day
- Organize the day's schedule at the center so as to be there at Telemedicine Unit at the scheduled time
- As a first step before starting interaction with remote doctor and patient over videoconference, review the EMR of the patient on the computer assisted by the technician and all diagnostic results attached with it
- At the start of the videoconference, ensure privacy of the room, introduce yourself to the
  patient and doctor. Make the patient comfortable to the virtual visit environment before
  starting discussion on his/ her medical problem
- Ensure good video and audio condition
- Further information/ clarification may be discussed interactively through videoconference with the patient and/or the doctor
- Appropriate advice is given on an electronic Report form to the remote doctor. Print out the same is signed in two copies one to be kept for personal record and other for Telemedicine Unit Record.

# 5 **Security Standards**

Wide access of information through web-based connectivity, create a great concern of privacy and confidentiality of patient's information. The transmission of information over communication lines lends itself to electronic intrusion and interception. Security policies must be developed and enforced to assure that the right information gets to the right people. In many respects, the use of tele-health does not alter existing issues relating to the privacy and confidentiality of patient's records.

There are 4 basic components to security approach:

- Authentication
- Identifying the person requesting information. Appropriate level of access
- · Location of Records
- Linking patient records
- Secure Transmission
- Assuring safe passage of information across public networks
- Implementation of local policies
- Allows the custodian of information to determine access rights.

Looking into the urgent need to standardize Electronic Medical/Health Records (EMR/EHR) maintained by different hospitals, and ensures that these records are shared across clinical establishments; Ministry had decided to notify the Electronic Health Records Standards. The EHR Standards were notified by the Ministry in September 2013. As far as possible the institutions having Telemedicine activities shall follow the EHR standards as notified by MoHFW.

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Security for tele-health system should be properly managed and enforced. The appropriate counter measures and enforcement strategies should be designed, developed and implemented.

# 6 Operational Standards

#### 6.1 Encryption Standards

All data encryption should comply with Data Encryption Standards (DES) as defined in the EGIT policy and Standards documents and ISO Encryption standards.

#### 6.2 Authentication Standards

Access authentication should comply with FIPS 113: Computer Data Authentication.

#### 6.3 Network Security

Networks should be reliable and secured to ensure user confidence, system and data integrity and robust system operation. Security control measure should include:

- (i) User security control for user access, group access, public access and local and remote access
- (ii) System and disaster control and recovery measures in the event of system failure.
- (iii) Data backup procedures
- (iv) Firewalls and user passwords to restrict unauthorized access to the network

## 6.4 Data security

Please refer to Data Policy Standards

## 6.5 Physical and Environmental Controls (ISO 27001)

- (I) Key computer equipment and network devices that store or communicate patient's data must be physically protected against unauthorized access and from accidental/deliberate loss or damage.
- (II) Appropriate and effective environmental controls must be implemented, utilized and maintained to preserve and to protect computer systems. These controls include, but are not limited to fire protection and an uninterrupted power supply.

#### **6.6 Virus Protection**

Virus protection must exist at network points where a potentially infected file(s) enters, leaves or is stores throughout the network

The operations of NMCN shall follow National Cyber Security Policy framework of Department of Electronics and Information Technology (DeitY), Government of India, aimed at protecting the public and private infrastructure from cyber-attacks. The policy also intends to safeguard

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"information, such as personal information (of web users), financial and banking information and sovereign data".

## 7 Backup and Recovery

Appropriate backup and recovery plans must be established for all data and applications. Access to back up information must be equal to or more restrictive than security measures taken to protect the original electronic information.

## 8 Contingency Plans

Contingency plans must exist and be implemented to enable the critical systems to resume operation in a timely manner after a serious disruption of these systems. The contingency plans must be documented and tested on a regular basis to ensure the plans remain current and operational.

#### 9 Monitoring

Appropriate measures must be taken to log, track, and monitor a user's actions or network connection. A program to assess overall compliance with the security practices and methods must be implemented.

# 10 Sanctions

Reported and identified incidents must be handled confidentially and responded to in an appropriate and timely connections may be suspended if deemed necessary to maintain the integrity of the computer systems.

#### 11 Ethics, Confidentiality and Privacy

In patient care utmost importance is placed on doctor – patient relationship or relationship between the patient and any healthcare professional. The basis of the relationship is mutual trust and respect. The cornerstone of such a relationship is that the doctor or healthcare provider treats the patient with dignity and respects any information given by the patient as confidential. This is embodied in the ethics of the medical profession. Ethical considerations govern all aspects of the relationship. In the process of tele-consultation the patient is usually at a site distant from the doctor or provider and both are linked by tele-communication. They may be fears that conventional ethical consideration may not be adhered to or the use of technology may not provide enough protection against confidentiality of information.

# ANNEXURE-I

	List of approved Human Resources for NMCN Project						
<b>A.</b> ]	A. Human Resources for Regional Resource Centre (New Recruitments)						
Sl. No.	Designation	No. of Post	Qualification	Terms of Reference (TOR)	Deliverables		
1	Telemedicine Infrastructure & Network Administrator	1	B.E. / B. Tech. in CS / IT / E & C, Master's in IT / CS or MCA with More than Five years of experience in IT facility management	1. Supervision of telemedicine technical infrastructure and the facility ensuring its smooth functioning 2. Co-ordination with agency providing maintenance support to ensure execution of Service Level Agreement 3. Preparation and execution of Telemedicine Programme schedule in co-ordination with the Nodal Officer and other stake holders such as faculty of the college/institute, Nodal Officer, RRC, other remote partners 4. Supervision of the work of Telemedicine Technician and covering his/her work during leave 5. Maintenance of Records such as Attendance Register, Log Book, Stock Inventory, Complaint Logs any other records as laid down in the Standard Operation Protocol etc.	Compiled Reports of Telemedicine activities on weekly, monthly and yearly basis     Compiled Reports of Annual Maintenance, monthly attendance, Leave Record, Log Book and periodic reports     Archived material of telemedicine sessions     Reports of technical performance status and daily network testing     Minutes of all meetings convened by the Nodal Officer     Any other documents / deliverables laid down in the SOP		
2	Content Developer	1	Any Graduate with One Year Diploma in IT/CS/ Multimedia etc. having more than Three years of experience in Multimedia content development. In additional to working experience with standard multimedia tools exposure with Softwares like Final cut Pro, Maya & 3D animation etc. will be preferred	1. Operation of medical education content development facility 2. Medical video capture, editing and voice over, Still photography as desired 3. Preparation of standard / animated power point presentation material 4. Operation of hardware and software relating medical education content development 5. Operation of web based tools for web enabled content 6. Any other work assigned by the Nodal officer / faculty members / laid down in the SOP	Repository of medical education content of the college/institution in various storage devices     Data Base of educational content and directory		
	TOTAL	2					

# **Human Resource at National Resource Centre (NRC)**

Sl. No.	Designation	No. of Post	Qualification	Max. Salary per Month	Draft Terms of Reference (TOR)
1	Manager (Telemedicine Network)	I	B.E. / B. Tech. and Master's in IT / CS/MCA or equivalent Experience: Minimum Seven Years of experience	50,000	1. Supervision of telemedicine technical infrastructure and the facility ensuring its smooth functioning 2. Co-ordination with agency providing maintenance support to ensure execution of Service Level Agreement 3. Preparation and execution of Telemedicine Programme schedule in co-ordination with the Nodal Officer and other stake holders such as faculty of the college/institute, Nodal Officer, RRC, other remote partners 4. Supervision of the work of Telemedicine Technician and covering his/her work during leave 5. Maintenance of Records such as Attendance Register, Log Book, Stock Inventory, Complaint Logs any other records as laid down in the Standard Operation Protocol etc.
2	Manager (Administration)	1	B.E. / B. Tech. and Master's in CS / IT / E & C/ MCA or equivalent Experience: Minimum Seven Years of experience	50,000	1. Provide administrative assistance to Nodal Officer, NRC for preparation of DPR, EOI, tender documents etc.  2. Management of project at NRC in coordination with network partners  3. Monitor the implementation process of project  4. Provide assistance for preparation of the activity report  5. Management of existing project initiatives of SGPGI  5. Management of the training programme at NRC  6. Teaching of diploma students  7. Management of m-Health programme like mHealth4U®, Mobile Telemedicine System (Bus)  8. Research & Development on m-Health & eHealth  9. Provide consultancy to state Govt. /NGOs, Private institutions etc. as directed by Nodal Officer, NRC.  10. Other as assigned by Nodal Officer, NRC
3	Web Site Designer	1	B.E. / B. Tech. or Master's in CS / IT / E & C or BCA with experience in XHTML, PHP, JavaScript, ASP.NET, NET (3.0 / 3.5), XML/XSLT, TSQL, SQL Server 2005/2008, SQL Reporting Services Experience: Minimum Five Years	40,000	<ol> <li>Designing of the web portals</li> <li>Management of existing web portals at NRC</li> <li>Design, Development and management of web portals</li> <li>Monitoring the web site maintenance</li> <li>Other duties, as assigned by Nodal Officer, NRC</li> </ol>

4	Web Developer	1	B.E. / B. Tech. or Master's in CS / IT / E & C, or BCA with experience in XHTML, PHP, JavaScript, ASP.NET, NET (3.0 / 3.5), XML/XSLT, TSQL, SQL Server 2005/2008, SQL Reporting Services Experience: Minimum Five Year	40,000	Development of webpages for portal development     Management of existing web portals at NRC     Development and management of web portal     Monitoring the web site maintenance     Other duties, as assigned by Nodal Officer, NRC
5	Web Site Programmer	1	B.E. / B. Tech. or Master's in CS / IT / E & C or BCA with knowledge of XHTML, PHP, JavaScript, ASP.NET, NET (3.0 / 3.5), XML/XSLT, TSQL, SQL Server 2005/2008, SQL Reporting Services Experience: Minimum Four Year	30,000	1. Responsible for website programming 2. Technical Assistance for the designing the web pages 3. Provide content (web pages) on time to development group 4. Make sure the compatibility on web languages 5. Reporting progress to the Nodal Officer, NRC 6. Other duties, as assigned by Nodal Officer, NRC
6	Content Developer	2	Graduate in IT/CS. having experience in Multimedia content development. In additional to working experience with standard multimedia tools exposure with Softwares like Final cut Pro, Maya & 3D animation etc. will be preferred	30,000	1. Operation of medical education content development facility 2. Medical video capture, editing and voice over, Still photography as desired 3. Preparation of standard / animated power point presentation material 4. Operation of hardware and software relating medical education content development 5. Operation of web based tools for web enabled content 6. Any other work assigned by the Nodal officer / faculty members / laid down in the SOP

			Experience: Minimum Four Years		
7	Information Manager / Librarian	1	Masters in Library Science & PGDLAN (Library Automation & Networking) with four years of exp. in digital library	30,000	Responsible for collection of information on telemedicine & e-Health related information     Compilation of the information and presented to the Nodal Officer, NCR     Preparation of reports on monthly updates in the field     Maintenance of the digital library infrastructure     Provide content material to the trainees, diploma students and researcher     Management of Library Information System     Management of log book of Library access     Other duties, as assigned by Nodal Officer, NRC
8	Administrative Officer	1	MBA with excellent knowledge of computing with exp. of Office & Admin. Work Experience: Minimum Four Years of experience in administrative role	30,000	1. Excellent computing skill 2. Supervision of manpower activities, maintaining leave record, assisting Nodal Officer in day to day administration 3. Maintenance of attendance registers 4. Make sure the discipline and punctuality 5. Responsible for maintenance of proper sanitation & hygienic premises 6. Liaising with Institute authority for day to day file processing & related work 5. Preparation of file for related work & maintenance of file log 6. Other duties, as assigned by Nodal Officer, NRC
9	Telemedicine Technician	5	Diploma in IT / CS/Electronics & Communication or Diploma in Telemedicine /HIMS Experience: Minimum One years of experience in O&M of IT system	20,000	1. Operation of Day to day telemedicine sessions 2. Technical testing with all telemedicine nodes connected under NMCN 3. Operation of Tele-follow-up session 4. Provide basic operation training to the trainees 5. Maintenance of daily session log book 6. Operation software & hardware videoconference system, any other equipment provisioned 7. Operation of telemedicine software 8. Digitization of analog content materials 9. Other duties, as assigned by the Administrator / Nodal Officer / as laid down in SOP
10	Driver	1	10 + 2 with driving license for Heavy Motor Vehicle Experience: Minimum five	15,000	Driving the Mobile Telemedicine Bus for field activities in m-Health delivery system     Maintenance of log book     Make sure the smooth functioning of vehicle operation     Other duties, as assigned by Nodal Officer, NRC

			years of driving experience		
11	Photocopy Machine Operator/ Office Asst.	1	10th Pass with minimum two years of experience as office assistant	12,000	<ol> <li>Handled the office photocopy work</li> <li>Binding (spiral &amp; comb) of books / printed papers</li> <li>Maintenance of the photocopy log book</li> <li>Assistance of officer work</li> <li>Other duties, as assigned by Nodal Officer, NRC</li> </ol>
12	Telephone Attendant	1	10th Pass with minimum two years of experience as office assistant	12,000	Handling of telecommunication services for smooth operation of the session and telephone     Handling of Fax machine     Make sure the entire telephone terminal operational     Day to day fault rectification     Other duties, as assigned by Nodal Officer, NRC.
13	Attendant	2	10th Pass with two years of experience as office attendant / housekeeping / photocopying / spiral binding / Receipt and dispatch of letters / Dispatch Register maintenance etc.	12,000	1. Handling the daily office door lock & closed 2. Letter receiving, dispatch & circulation 3. Circulation of the file, notices etc. 4. Hospitality services for the senior staff & guest 5. Housekeeping secrecies 6. Other duties, as assigned by Nodal Officer, NRC
	TOTAL	19			