प्रथम चरण : लिखित परीक्षा (Written Examination) पूर्णाङ्क : 200

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प्रश्न : 
1. लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली वा अंग्रेजी दुबै हुनेछ।
2. प्रवक्ताको प्रवक्ता पत्र प्रवक्ताको लिखित परीक्षा छाउँछ हुनेछ।
3. वस्तुतात्त्विक (Multiple Choice) प्रश्नहरूको गलत उत्तर दिइबाट प्रवक्ताको गलत उत्तर बालत र त्यस प्रतिबन्ध अड़ कहाँ गरिदैछ। तर उत्तर निर्णयका लागि बालत अड़ बिदिने सै अड़ कहाँ पनि गरिदैछ।
4. वधैरीजिक प्रश्नहरू हुनेका परीक्षाका कुल प्रश्नहरूलाई क्याल्कुलेटर (Calculator) प्रयोग गरिदैछ।
5. विषयमा प्रश्नहरूको हक्कमा त्यसजस्तै एउटा लागि प्रश्न लागि एउटा प्रश्न दुई दुई भन्दा वटी भाषा (Two or more parts of a single question) वा एउटा प्रश्न अन्तर्गत दुई दुई वटी टिप्पणीहरू (Short notes) सोज सक्नेछ।
6. तित्तिक पराम (बिन्दु प्रश्न हुनेका हक्कमा) प्रश्नहरूका घटकला नागरिकहरूको माध्यम नेपाली वा अंग्रेजी दुबै हुनेछ।
7. परीक्षालीले प्रश्नहरूका घटकला नागरिकहरूको उन्नत प्रकार प्रश्नहरूलाई उत्तरप्रदानका माध्यमलाई विश्वसनीय संस्थापना हुनेछ।
8. यस पाठ्यक्रममा योजना अन्तर्गतका पत्र /विषयका विषयबन्धनमा जेबको लेखिएको भए तपाईं पाठ्यक्रममा परेको कार्य, एतिहासिक, संस्कृति, नैतिक, कार्यकीर्ति, परीक्षाको भित्र प्रत्येक महत्त्वपूर्ण सहजता भएको सहजता भएको अन्तर्भक्त भएको हुनेछ।
9. प्रथम चरणको परीक्षालाई छौट भएको उमेदवारहरूलाई मात्र द्वितीय चरणको परीक्षामा सम्मिलित गराउनेछ।
10. यस पाठ्यक्रम लागू भएको माध्यम उन्नत भएको माध्यम नेपाली वा अंग्रेजी हुनेछ।
Part (I) : General Awareness & General Ability Test (50 Marks)

1. General Awareness and Contemporary Issues (25 \times 1 \text{ Mark} = 25 \text{ Marks})
   1.1 Physical, socio-cultural and economic geography and demography of Nepal
   1.2 Major natural resources of Nepal
   1.3 Geographical diversity, climatic conditions, and livelihood & lifestyle of people
   1.4 Notable events and personalities, social, cultural and economic conditions in modern history of Nepal
   1.5 Current periodical plan of Nepal
   1.6 Information on sustainable development, environment, pollution, climate change, biodiversity, science and technology
   1.7 Nepal's international affairs and general information on the UNO, SAARC & BIMSTEC
   1.8 The Constitution of Nepal (From Part 1 to 5 and Schedules)
   1.9 Governance system and Government (Federal, Provincial and Local)
   1.10 Provisions of civil service act and regulation relating to constitution of civil service, organisational structure, posts of service, fulfillment of vacancy and code of conduct
   1.11 Functional scope of public services
   1.12 Public Service Charter
   1.13 Concept, objective and importance of public policy
   1.14 Fundamentals of management : planning, organizing, directing, controlling, coordinating, decision making, motivation and leadership
   1.15 Government planning, budgeting and accounting system
   1.16 Major events and current affairs of national and international importance

2. General Ability Test (25 \times 1 \text{ Mark} = 25 \text{ Marks})
   2.1 Verbal Ability Test (8 \times 1 \text{ Mark} = 8 \text{ Marks})
      Jumble words, Series, Analogy, Classification, Coding-Decoding, Matrix, Ranking Order Test, Direction and Distance Sense Test, Common Sense Test, Logical Reasoning, Assertion and Reason, Statement and Conclusions

   2.2 Numerical Ability Test (9 \times 1 \text{ Mark} = 9 \text{ Marks})
      Series, Analogy, Classification, Coding, Arithmetical reasoning/operation, Percentage, Ratio, Average, Loss & Profit, Time & Work, Data interpretation & Data verification

   2.3 Non-verbal/Abstract Ability Test (8 \times 1 \text{ Mark} = 8 \text{ Marks})
      Figure Series, Figure Analogy, Figure Classification, Figure Matrix, Pattern Completion/Finding, Analytical Reasoning Test, Figure Formation and Analysis, Rule Detection, Water images, Mirror images, Cubes and Dice & Venn-diagram
Part (II) : - General Technical Subject (50 Marks)

Electronic Device and Circuit  
Diodes (Tunnel, varactor, zener, diac, Triac, bridge, Impatt, Gunn, photo) and applications, Bipolar transistors switching characteristics, unijunction transistor, MOS transistors switching characteristics, SCR, UJT, TTL logic circuits, NMOS/C莫斯 logic circuits, memory: RAM, DRAM, PROM, EPROM, operational amplifiers, Butterworth and Chebysev filters, A/D converters, adders, arithmetic operations, digital comparators, parity check generator, multiplexer and demultiplexer, flip-flops, shift register, counters, sequence generators, oscillators(wien bridge oscillators, tuned, LC oscillators, crystal, clap modification), resonant circuits, thyristor, controlled rectifier circuits, 7 segment display, amplifier (Untuned, push-pull, feed back amplifiers, Klystron, Magetrons) bode plot analysis, Emitter, clipper, collector, clamper circuits

Communication Engineering  
Frequency spectrum (discrete and continuous) and bands, coulomb’s law and electric field intensity, electric flux density and gauss’ law, Spectral density, Noises (atmospheric, thermal, partition, white noise, Gaussian noise, Noise ratio(s)), Maxwell’s first equation and application, divergence theorem, energy and potential, Fourier series, Laplace equation and Poisson equation, biot-svart’s law, ampere’s circuital law, curl, wave motion in free space, perfect dielectric and losses, wave medium, skin effect, impedance matching, antenna fundamental (Horn, slot, parapolic, yagi, Cassegrain, lens), polarization, radiation from dipole antenna, wave guides(broad-band guides, Cylindrical, ridged)

Instrumentation & Control System  
Dynamometer, Multimeter, Oscilloscopes, Signal generator, Impedance Bridges (Maxwell, Hay, Schering, Anderson, Desauty), Transducers (Strain Guages, Thermistor, Piezoelectric tacheometer, thermocoupler) Open loop and closed loop control system, system stability and sensitivity, system transfer functions and responses, poles and zeros location and their significance, root locus method, frequency response method, Bolometers technique for measurement of power

Signal analysis and processing  
Discrete probability theory, Information theory, Shannon-Hartley law, transmission of signal, impulse response and convolution, Fourier series, Fourier transform, unit step, delta, sinc and signum function, helbert transform, LTI system, system described by differential and difference equations, FIR and IIR filters, discrete Fourier transforms, IDFT, FFT, circular convolutions, Parseval’s theorem, energy, power and autocorrelation, Z transform

Basic Analog and Digital Communications  
Difference between analog and digital communications, basic communication elements, signal and noise in communication system, AM, DSC-SC, PM, FM, Super-heterodyne AM and FM receiver, SSB, D/A and A/D Converters, sampling theorem, sample and hold circuit, A law, m-law, quantizer, coding (NRZ/HDB3/AMI), error detection and correction, Parity check, PCM/ADPCM, digital modulation (ASK/PSK/QPSK/MSK/QAM/CDMA/ FDMA/DSSS), pulse modulation, modulation and demodulation circuits, Frequency hopping, frequency converter and mixers, phase locked loop

Telecommunications and advanced communications  
Different between Telecommunications and Radio Communication, Return loss transformer and hybrid circuit, signal and noise measurements, echo and singing, space/time/frequency /wave length division multiplexing, erlang B formulae, queuing theorem, OSI layers, telephony, functions of switching, electro mechanical switches, stored programmed controlled
7. Optical System  
Laser, Photocell, photo device (LED, CRT, photovoltaic, photo-multipliers, APD's PCN), Principle of optical communication, Total internal reflection, Snell’s law, Chemical vapour Deposition, optical fibers types, capacity and properties, optical transmission, optical transmitters and receivers, interconnected and switched, Joining techniques, splices, connectors and coupling, fiber optics networks, optical switching, underground cabling (Route and ambient consideration, tension prediction)

8. Wireless Communications  
Radio frequency band, Propagation theory (groundwave, spacewave, tropospheric, ionospheric), Euler-Larmour theory, LOS (line of sight) and non-LOS model, Okumara and Hata model, Mobile Technologies (DECT, GSM, CDMA2000-1x and etc.), Fundamental of satellite communication (tracking, Satellite orbits and Radio spectrum, satellite wave propagation and satellite antennas), digital satellite communication system, earth stations, Kepler’s laws of orbital motion, signal to noise ratio, interference between different wireless systems. Antennas (Directional, Non-directional, reflective), impedance and effective length of antenna as transmitter & receiver, Radiation pattern, broad-side pattern, Eudfire pattern, Pattern synthesis

9. Computers and Network  
Different between analogue and digital computer, Binary system and Boolean algebra, Gates, Computer structure (I/O devices, Storage devices, Memories) and typical processor architecture, CPU and memory organization, buses, Characteristics of I/O and storage devices, Processing unit and controller design, hardware and micro program control, Instruction sets and addressing modes, memory systems (main, auxiliary, virtual, cache), assembly language programming, I/O and interrupt servicing, Multiplexing, (time, frequency and code division multiplexing), Digital networks: ISDN, frame relay and ATM. Protocols: (such as ISO/OSI reference model, X.25, IP), LAN/WAN topologies, access schemes, medium access and logic layers; CSMA/CD and token ring protocols; segmented and hubbed LANs, Operating system principles, components, and usage(Multitasking and/or multiprocessing, Real-time aspects)

10. Information and Communications Technology (ICT)  
Computer architecture, microprocessor fundamental, microcomputer systems, parallel and serial interfaces, RS-232 standards, flow charts, algorithms, variables, constants, data types, arithmetic expressions, arrays, concept of Operating System, Basic concept on internet, e-mail and web-page (such as DNS, IP, URL, http, ftp, IRQ, Routers). Server (Web, email, printer), General concept of Cyber security (digital signature, SPAM, VIRUS, WORM, hiking, cracking), Unicode