नेपाल नागरिक उड्डयन प्राधिकरण
प्राबिधिक सेवा, ईलेक्ट्रोनिक एण्ड टेलिकम्युनिकेशन ईन्जिनियरिङ्ग समूह, पाँचौ तह, वरिष्ठ सहायक पदको खुला/आन्तरिक प्रतियोगितात्मक परीक्षाको पाठ्यक्रम

द्वितीय पत्र – सेवा सम्वन्धी

खण्ड (क) – ५० अङ्क

1. **Semiconductor Devices**
   Semiconductor diodes, SCR, Diacs, tunnel diodes, optoelectronics devices, Zener diodes, Field Effect Transistor, Bipolar transistors, Signal analysis in CE, CC and CB configurations, MOSFET, TTL utilizing bipolar transistor, MOSFET, NMOS and CMOS, Operational Amplifiers – ideal opamps, feedback, inverting and non-inverting amplifiers, summing, integrator, differentiator, RC and active filters, Integrated circuit concepts, commercial ICs

2. **Digital electronics**
   Analog and digital signal definition, advantages of digital over analog; Decimal and binary systems, base conversion methods, complements of numbers, basic arithmetic of binary numbers, octal and hexadecimal numbers; Digital fundamentals – logic gates, symbols, truth table, Boolean algebra; Design system building blocks – half adder, full adder, encoder, decoder, multiplexer, de-multiplexer; Memories - RAM, ROM, PROM, EPROM, DRAM; Digital display, Basic computer architecture; Flip flop, latches, shift register, clock, triggering

3. **Antenna, Transmission Lines and Propagation**
   Electromagnetic field, frequency bands used in communication and radio broadcasting, propagation of radio waves in different frequency bands, types of transmission lines used in radio communication and broadcasting, coaxial cable, open wire, wave guide and optical fiber, coaxial connectors, SWR, relationship of wavelength and frequency, antenna as a media for reception and transmission of RF energy, types of antenna, Aviation Radio Band and its uses, Aviation radio spectrum management

4. **Communication Techniques**
   Basic knowledge of wire and radio communication; Radio transmitters and receivers, electromagnetic waves, RF energy, audio and video signaling, digital and analog signals; Digital to analog and analog to digital conversion, PLL; Modulation methods - AM, FM, SSB, PM, PCM, TDM; Methods of long distance communications; Television and Radio Broadcasting; General knowledge of Microwave, Optical and Satellite communication

5. **Hand Tools and their uses**
   Identification, specifications, uses and maintenance of commonly used hand tools like screw drivers, pliers, tweezers, tester, wire stripper, krone tool, LAN tester, Earthing tester

6. **Basics of AC and Electrical/Electronic Cables**
   Different type of electrical cables and their specifications, Types of wires & cables, Classification of cables, Types of connectors used in electrical and electronic applications, assembly and their classification

7. **Cells and Batteries**
   Types of cells, Specifications of cells and batteries, use of hydrometer, Types of electrolytes used in cells and batteries

खण्ड (ख) – ५० अङ्क

8. **Soldering & De-soldering**

Different types of soldering guns, related to temperature and wattage, types of tips, Solder materials and their grading, Use of flux and other materials, Selection of a soldering gun for specific requirement, Soldering and De-soldering stations and their specifications

9. **Fiber Optic communication**

Introduction to optical fiber as a transmission media, its advantages over other media, properties of optic fiber, testing, losses, types of fiber optic cables and specifications. Encoding of light, Fiber optic joints, splicing, testing and the related equipments/measuring tools, precautions to be taken laying of cables, safety aspects while handling optical cables

10. **Audio/Visual Equipments**

Audio and video amplifiers, small and large signal amplifications; Types of microphones and speakers; Quality of AM and FM reception, stereo and mono sound reproduction systems; Digital audio and compression techniques, Audio Tape recorder/player, DAT, Optical Disc Players Tape Recorder/ Player, Video Formats, Video Camcorders; Video digitization techniques

11. **Power Supply Systems**

Basic knowledge of Generators; Solar Power System; Storage Batteries; Electric Motors; Single Phase/Three Phase AC supplies; DC Supply; Voltage and Current Regulators, Inverters, UPS, SMPS; Isolation and power transformers; Surge protectors; Earthing System; Lightning Protection

12. **Test Equipment**

Electronic voltmeters and multimeters, Oscilloscope, Semiconductor tester for discrete and IC devices, AF and RF Generators, Frequency counter, Spectrum Analyzer, OTDR, Splicing Machine, Wattmeter, Ground Resistance Tester

13. **Information Technology**

General knowledge of computer hardware and software, networking devices, internet, intranet and modem. Local and wide area networking, managed and un-managed switches, routers, servers, firewall

द्वितीय पत्रबाट निम्नानुसार प्रश्न सोधिनेछ :

खण्ड	अङ्कभार	विषयगत प्रश्न	
		छोटो उत्तर	लामो उत्तर
(क)	५०	६ प्रश्न X ५ अङ्क= ३०	२ प्रश्न X १० अङ्क= २०
(ख)	५०	६ प्रश्न X ५ अङ्क= ३०	२ प्रश्न X १० अङ्क= २०
जम्मा	१००	१२ प्रश्न X ५ अङ्क= ६०	४ प्रश्न X १० अङ्क= ४०

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प्रयोगात्मक परीक्षाको पाठ्यक्रम

पूर्णाङ्क : ३० उत्तीर्णाङ्क : १५

Group-A **10 Marks**

1. Introduction of soldering joints
- 1.1. Characteristics of soldering lead
- 1.2. Soldering method
- 1.3. Usage of soldering flux
- 1.4. Common types of soldering defects
- 1.5. Choosing proper soldering iron temperature

2. Safety at electronics workshop
- 2.1. Introduction
- 2.2. Use
- 2.3. Importance
- 2.4. ESD Protection

3. Common Electrical Components used in Electrical
- 3.1. Circuit breaker, MCB, RCCB, isolators
- 3.2. Coaxial cable and types
- 3.3. Transmission lines and types
- 3.4. Common plug types
- 3.5. Workbench Tools and equipment

Group-B **10 Marks**

4. Common Energy Storage devices
- 4.1. Types, Charging characteristics and maintenance
- 4.2. Safety precaution while handling flooded-type batteries
- 4.3. Introduction, uses and method of using hydrometer

5. Types of Power Supply
- 5.1. Types of UPS
- 5.2. PV Supply components and trouble-shooting
- 5.3. Switch-over and AMF panel

Group-C **10 Marks**

6. RF measurements
- 6.1. Use of Wattmeter
- 6.2. Application of dummy load
- 6.3. Calculation of Forward Power, Reverse Power, VSWR

7. Test Equipment
- 7.1. Common electronic bench test equipment
- 7.2. Types of probes
- 7.3. Usage
- 7.4. Safety precaution