

नेपाली सेना

प्रा.अम.ए.सि.मेकानिक्स (खूला र आन्तरिक) पदको पेशा सम्बन्धी विषयको लिखित परिक्षा योजना र पाठ्यक्रम

विषय	पूर्णाङ्क	उत्तीर्णाङ्क	परीक्षा प्रणाली		प्रश्न संख्या X अङ्क	समय
पेशा सम्बन्धी	१००	४०	वस्तुगत (Objective)	बहुवैकल्पिक प्रश्न (MCQs)	४० प्रश्न X १ अङ्क = ४०	२ घण्टा ३० मिनेट
			विषयगत (Subjective)	छोटो उत्तर	१५ प्रश्न X २ अङ्क = ३०	
				लामो उत्तर	६ प्रश्न X ५ अङ्क = ३०	

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Unit: 1

1. **Basic Electricals**

Current, Voltage, Resistor, Electrical Circuit, Single Phase and Three Phase, Ohm's Law, Resistance and temperature variation of resistance, Series and parallel combining of resistance, Krichoff's law, Power and Energy, EMF, Faraday's law of EMF. Construction and working Principle of Transformer, Primary and secondary cell

2. **Thermodynamic**

Introduction of Thermodynamic system and its properties, State of thermodynamic system, Cycle, Thermodynamic Process, Temperature, Heat, Work and Energy, Gas laws of thermodynamics (Boyles law, Charles law), Internal Energy, Thermal Efficiency, First law of Thermodynamics, Constant volume process, constant pressure process, constant temperature process, Isothermal and adiabatic process, poly-tropic process & cycles (Otto Cycle, Diesel cycle, Refrigeration cycle), Mode of heat transfer (Convection, Conduction, Radiation)

3. **Workshop Technology**

Introduction and types of safety, Properties of workshop, Arc Welding, Gas Welding, Brazing, Swaging, Flaring tube cutting measurement

Unit: 2

1. **Basic Concept of Refrigeration**

Introduction of Refrigeration, History and Development of Refrigeration, Types of Refrigeration, Unit of Refrigeration, Application of Refrigeration

2. **Terminology Used in Refrigeration**

Heat, mass, work, joule, pressure, temperature, sensible heat, latent heat, power, energy, volume, density, specific density, humidity, British Thermal Unit (BTU), vaporization, vacuum, speed and velocity, rest and motion, super heat gas, wet condition, COP, specific gravity, mass and weight

3. **Vapor Compression Refrigeration**

Introduction, Component of the system operation, Cycle of Vapor Compression system

4. **Mechanical Component of Refrigeration**

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Compressor: Compressor and its function-mode of drive, types of compressor, classification and application; Condenser: It's function, types and classification, construction and application; Evaporators: It's function, types and classification and application; Cooling tower: Introduction, Types and use; Heat Exchanger: Introduction, Types and use; Expansion Device: Concept of expansion device, Working principle and type of expansion device

5. **Electrical Component of Refrigeration System:**

Thermostats, Starting relay, Capacitor, Over Load protector, Defrost timer, defrost heater, Switch, Fuse, Cabinet bulb, PCB, AC control Board

6. **Refrigerant Controlled Valve**

Service Valve, Solenoid Valve, Liquid Pressure Valve, Evaporator Pressure, Regulating Valve, Check Valve

7. **Safety Controlled Switch**

HPC, LPC, Pressure released valve, OLP, Bimetal Fuse

8. **Refrigerant**

Introduction and classification of Refrigerant, Properties of Ideal Refrigerant, Primary & Secondary refrigerant, Comparison of Refrigerant, Thermodynamic, Chemical and Physical Properties of Refrigerant, Selection of Refrigerant, Methods of refrigerant, Charging in refrigeration system, Refrigerants and its effect in atmosphere

9. **Leakage Detection**

Method of Leakage detection, Important of Leakage detection, Types of detection

Unit: 3

1. **Air Conditioning**

Introduction and air conditioning parameters, Types of Air Conditioner, Application of air condition

2. **Heat and Temperature**

Introduction, Dry bulb temperature, Wet bulb temperature, Saturation Temperature, Dew point temperature, Ambient temperature, outdoor temperature, Indoor temperature

3. **Air Conditioning System and Equipment**

Introduction, Construction and operation of air conditioning equipment, type of Air Conditioning system and Equipment (Direct expansion, all air system, all water system, Air water system), Window type Air conditioner, Split type air conditioner, package type air conditioner

4. **Mechanical Component of Air Condition**

Compressor, Condenser, Filter, Dryer, Expansion device, Evaporator, Condenser fan motor

5. **Electrical and Electronics Component of Air Condition**

Resistor, Capacitor, Spike, Relay, Transistor, Rectifier Transformer, contactor, Over load, condenser fan (axial fan, Blower fan) Remote setting

6. **Heat Pump**

Introduction to heat pump, Application of heat pump, method of reversing refrigeration cycle, construction & operation of solenoid, Four way valve

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Unit: 4

1. **Automobile Air Conditioning System**

Introduction of Automobile Air conditioning, working principle of car AC, Component use in car AC

2. **Heating system in Automobile Air Conditioning**

Working principle, component use in heating system

3. **Air Distribution System in Automobile Air Conditioning**

Blower, Condenser fan, Air Filter, Magnetic Clutch, Solenoid Valve

Unit 5

1. **Design Condition**

Choice of inside design, comfort, outside design, choice of supply design condition, critical load condition, solar radiation, load calculation and applied Psychrometrics, design of air conditioning apparatus, transmission and distribution of air, types of fan, fan characteristics and fan arrangement

2. **Applications in Food Processing and Preservation**

Typical examples of food processing and storage, transport refrigeration, cooling and heating of foods, freezing of foods, freeze drying, heat drying of foods and other application; Domestic Refrigeration System: Freeze, Water cooler, air condition, Ice cube maker; Commercial Refrigeration System: Central plant V.R.F.

यस पेशा सम्बन्धी विषयको पाठ्यक्रमका एकाईहरूबाट सोधिने प्रश्नहरूको संख्या निम्नानुसार हुनेछ ।

एकाई नं. (Unit No.)	अङ्कभार (Weightage)	बहुवैकल्पिक प्रश्न (MCQs) को संख्या	छोटो उत्तर प्रश्नको संख्या	लामो उत्तर प्रश्नको संख्या
1.	15	5	१५ प्रश्न X २ अङ्क	६ प्रश्न X ५ अङ्क
2.	30	14		
3.	25	10		
4.	20	8		
5.	10	3		
जम्मा	100	४० प्रश्न x १ अङ्क = ४० अङ्क	१५ प्रश्न X २ अङ्क = ३० अङ्क	६ प्रश्न X ५ अङ्क = ३० अङ्क

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प्रा.अम. प्रा.अम.ए.सि.मेकानिक्स (खुला र आन्तरिक) पदको प्रयोगात्मक परीक्षाको
पाठ्यक्रम

समय: १ घण्टा

पूर्णाङ्क : ५०
उतीर्णाङ्क : २५

विषयवस्तु	प्रश्न संख्या	अंकभार	पूर्णाङ्क
1. Fault Finding 2. Adjustment 3. PCB Troubleshooting	10	3	30
4. Parts Identification 5. Viva	10	2	20

द्रष्टव्य: प्रयोगात्मक परीक्षाको लागि लिखित परीक्षाको पाठ्यक्रमबाट प्रश्नहरू सोधिनेछन् ।