



ललितपुर महानगरपालिका
नगर कार्यपालिकाको कार्यालय
पुल्चोक, ललितपुर, ३ नं प्रदेश, नेपाल

इञ्जिनियरिङ्ग सेवा, मेकानिकल समूह, निर्माण उपकरण संभार उपसमूह, पाँचौं तह, सिनियर मेकानिक्स पदका
लागि प्रतियोगितामत्क लिखित परीक्षाको पाठ्यक्रम

पाठ्यक्रमको रूपरेखालाई निम्न अनुसार विभाजन गरिएको छ :

प्रथम चरण :-	लिखित परीक्षा	पूर्णाङ्क :- १००
द्वितीय चरण :-	(क) प्रयोगात्मक	पूर्णाङ्क :- ५०
	(ख) अन्तर्वार्ता	पूर्णाङ्क :- ५०

परीक्षा योजना (Examination Scheme)

पत्र	विषय	पूर्णाङ्क	उत्तीर्णाङ्क	परीक्षा प्रणाली	प्रश्नसंख्या X अङ्क	समय
प्रथम	सवो सम्बन्धी	१००	४०	वस्तुगत : बहुवैकल्पिक प्रश्न (MCQs)	१०० प्रश्न X १अङ्क	१ घण्टा १५मिनेट

विषय	पूर्णाङ्क	उत्तीर्णाङ्क	परीक्षा प्रणाली	समय
(क) प्रयोगात्मक परीक्षा	५०	२५	प्रयोगात्मक	४५ मिनेट
(ख) अन्तर्वार्ता	५०		मौखिक (Oral)	

द्रष्टव्य :

- यो पाठ्यक्रम योजनालाई लिखित परीक्षा (प्रथम चरण) तथा अन्तिम चरण (अन्तर्वार्ता) गरी दुई भागमा विभाजन गरिएको छ ।
- प्रश्नपत्र अंग्रेजी भाषामा हुनेछ ।
- लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुनेछ ।
- वस्तुगत बहुवैकल्पिक (Multiple Choice) प्रश्नहरूको गलत उत्तर दिएमा प्रत्येक गलत उत्तर बापत २० प्रतिशत अङ्क कट्टा गरिनेछ । तर उत्तर नदिएमा त्यस बापत अङ्क दिइने छैन र अङ्क कट्टा पनि गरिने छैन ।
- परीक्षामा कुनै प्रकारको क्याल्कुलेटर (Calculator) प्रयोग गर्न पाइने छैन ।
- कार्यालय बाट संचालन हुने परीक्षामा परीक्षार्थीले मोबाइल वा यस्तै प्रकारका विद्युतीय उपकरण परीक्षा हलमा लैजान पाइने छैन ।
- लिखित परीक्षामा छनौट भएका उम्मेदवारहरूलाई मात्र द्वितीय चरणको परीक्षामा सम्मिलित गराइनेछ ।
- यस पाठ्यक्रम योजना अन्तर्गतका पत्र/विषयका विषयवस्तुमा जेसुकै लेखिएको भए तापनि पाठ्यक्रममा परेका कानून, ऐन, नियम तथा नीतिहरू परीक्षाको मिति भन्दा ३ महिना अगाडि (संशोधन भएका वा संशोधन भई हटाईएका वा थप गरी संशोधन भई) कायम रहेकालाई यस पाठ्यक्रममा परेको सम्झनु पर्दछ ।
- पाठ्यक्रम लागू मिति : २०७६/०८/१४

इञ्जिनियरिङ्ग सेवा, मेकानिकल समूह, निर्माण उपकरण संभार उपसमूह, पाँचौं तह, सिनियर मेकानिक्स पदका लागि प्रतियोगितामत्क लिखित परीक्षाको पाठ्यक्रम

पत्र/ विषय :- सेवा सम्बन्धी

1. Workshop Practices

- 1.1. Measuring Instruments - Scale, Try square, Bevel Protractor, Vernier Caliper, Micrometer, Gauges and Filler Gauges; Metric, FPS and SI Unit
- 1.2. Hand tools and their applications
- 1.3. Basic knowledge of Lathe, Milling, Shaper, Grinding and Drilling Machine

2. Engineering Graphics and Machine Drawing

- 2.1. Finding out the missing views from two given projection and dimensioning
 - 2.1.1. Missing views of prismatic and cylindrical work pieces
 - 2.1.2. Missing views of pyramidal, conical, cylindrical cut work pieces
- 2.2. Isometry drawing of machine parts including sections
- 2.3. Drawing of joints, drawing exercises and orthographic projection

3. Welding and Sheet Metal Works

- 3.1. Different types of welding and their applications
- 3.2. Welding equipment, tools, accessories and types of electrodes
- 3.3. Soldering and Brazing
- 3.4. Welding defects, causes and remedies
- 3.5. General Fitting - Male & Female Joints by Marking, Sawing, Chiseling, Cutting, Joining
- 3.6. Cutting, Folding, Bending of Sheet Metal

4. Construction Equipment Types and Their Major Components

- 4.1. Dozer, Loader, Excavator, Grader, Crane and Roller
- 4.2. Dragline Machine
- 4.3. Pile Drive Machine

5. Engines

- 5.1. Classification of engine
- 5.2. Working principle of two stroke cycle and four stroke cycle engine
- 5.3. Functions of engine components
- 5.4. Identification of need of engine overhaul
- 5.5. Purpose and function of super charger and turbo charger
- 5.6. Troubleshooting

6. Thermodynamics

- 6.1. Terms used in thermodynamics
- 6.2. First and Second law of thermodynamics
- 6.3. Otto cycle and diesel cycle

7. Cooling System

- 7.1. Introduction to cooling system
- 7.2. Purpose of cooling system
- 7.3. Working principle of cooling system
- 7.4. Components of cooling system
- 7.5. Coolants, its types and properties
- 7.6. Troubleshooting

8. Brake System

- 8.1. Purpose of brakes in equipment
- 8.2. Classification of brakes and their functions
- 8.3. Components of brake system
- 8.4. Troubleshooting

9. Suspension System

- 9.1. Introduction to suspension system
- 9.2. Classification of suspension system
- 9.3. Working principle and components of suspension system
- 9.4. Troubleshooting

10. Steering System

- 10.1. Introduction to steering system
- 10.2. Types of steering system
- 10.3. Operation of power steering
- 10.4. Troubleshooting

11. Transmission System

- 11.1. Function of clutch
- 11.2. Introduction and purpose of Propeller shaft and Universal joint
- 11.3. Function of Gear Box
- 11.4. Knowledge about operation of Torque Converter
- 11.5. Working principle and components of automatic transmission
- 11.6. Component of final drive and its functions

12. Hydraulic System

- 12.1. Introduction to Hydraulic System
- 12.2. Components of Hydraulic System and their function
- 12.3. Knowledge about Hydraulic Hose and Pipe

13. Starting System

- 13.1. Introduction and function of starting system
- 13.2. Function of different parts of starting system
- 13.3. Troubleshooting

14. Track, Wheels and Tyre

- 14.1. Introduction to track, wheel and tyres
- 14.2. Types of wheel, tyres and rating of tyres

- 14.3. Advantages and disadvantages of radial ply and cross ply tyres
- 14.4. Comparison between wheel mounted and track mounted machine
- 14.5. Troubleshooting of track, wheel and tyres

15. Fuel, Lubricants and Filters

- 15.1. Different types of fuels and lubricants used in equipment
- 15.2. Application and changing interval of lubricants
- 15.3. Knowledge of changing of Air, Fuel, Engine Oil, Hydraulic and Transmission filter

16. Electrical System

- 16.1. Maintenance of the battery
- 16.2. Lights used in equipment and vehicles
- 16.3. Fuses and wiring in equipment and vehicles
- 16.4. Electrical system and component used in equipments and vehicles
- 16.5. Basic Knowledge of Motors and Generators (electro-mechanical principle)

17. Air Conditioning

- 17.1. Introduction and lay out of air conditioning system
- 17.2. Introduction and function of different components of air conditioning
- 17.3. Types of refrigerant
- 17.4. Troubleshooting

18. Emission Control System

- 18.1. Purpose and importance to emission control system
- 18.2. Vehicle emission norms and standards
- 18.3. Function and working principle of emission control system and devices

19. Maintenance System

- 19.1. Types of maintenance system
- 19.2. Importance of maintenance
- 19.3. Advantage and disadvantage of different maintenance system

20. Record Keeping

- 20.1. Importance of record keeping
- 20.2. Knowledge of maintenance Job Card
- 20.3. Basic knowledge of operation log sheet
- 20.4. Use of parts catalogue/workshop manual
- 20.5. Depreciation and its types
- 20.6. Methods of estimation
- 20.7. Costing and pricing

21. Safety Practices

- 21.1. Safety : Types and importance

21.2. Safety tools and devices

प्रयोगात्मक परीक्षा (**Practical Exam**) को लागि पाठ्यक्रम

1. Identification of hand tools and special tools.
2. Identification of main components and parts of machine.
3. Identification of major specifications of machine
4. Identification, handling and storing of different lubricants and fuels
5. Identification and uses of safety tools and devices
6. Uses of lifting and hoisting devices
7. Changing of hydraulic pipe, hose and grease nipples
8. Change of oil/fuel/air/hydraulic/transmission filter and lubricants.
9. Servicing of cooling system.
10. Servicing of fuel system.
11. Servicing of clutch system.
12. Servicing of brake system.
13. Steering /Hydraulic system servicing.
14. Servicing of minor electrical system components.
15. Adjustment of fuel injection pump
16. Adjustment of tappet clearance
17. Adjustment of fuel injection pump timing
18. Use of workshop manuals and parts catalog
19. Use of drill machine
20. Maintenance of undercarriage of construction equipment
21. Testing of nozzle injector