

शहीद गंगालाल राष्ट्रिय हृदय केन्द्र, पदपूर्ति समिति

पद : ओभरसियर (सेवा -प्राविधिक, समूह - इन्जिनियरिङ्ग, उप-समूह - इलेक्ट्रिकल) रा.प.अनं प्रथम (ख) को

खुल्ला / आन्तरिक प्रतियोगितात्मक लिखित परीक्षाको पाठ्यक्रम

एवं परीक्षा योजना

यस पाठ्यक्रम योजनालाई दुई चरणमा विभाजन गरिएको छ :

प्रथम चरण :- लिखित परीक्षा (Written Examination)

पूर्णाङ्क :- २००

द्वितीय चरण :- अन्तर्वार्ता (Interview)

पूर्णाङ्क :- ३०

प्रथम चरण (First Phase) : लिखित परीक्षा योजना (Written Examination Scheme)

Paper	Subject	Full Marks	Pass Marks	No. Questions & Weightage	Time Allowed
I	Technical Subject	100	40	(Objective Multiple Choice Questions) 50 × 2 = 100	1.00 hrs
II		100	40	(Subjective Descriptive Type) 8 × 5 = 40 (Short answer) 6 × 10 = 60 (Long answer)	3.00 hrs

द्वितीय चरण (Second Phase)

Subject	Full Marks	Examination
Interview	30	Oral

द्रष्टव्य :

- लिखित परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुनेछ ।
- प्रथम र द्वितीय पत्रको विषयवस्तु एउटै हुनेछ । तर प्रथम र द्वितीय पत्रको लिखित परीक्षा छुट्टाछुट्टै 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 ।
- परीक्षार्थीले वस्तुगत बहुवैकल्पिक प्रश्नको उत्तर लेख्दा अंग्रेजी ठूलो अक्षर (Capital letter) A, B, C, D मा लेख्नुपर्नेछ । सानो अक्षर (Small letter) a, b, c, d लेखेको वा अन्य कुनै सङ्केत गरेको भए सबै उत्तरपुस्तिका रद्द हुनेछ ।
- बहुवैकल्पिकप्रश्नहरू हुने परीक्षामा कुनै प्रकारको क्याल्कुलेटर (Calculator) प्रयोग गर्न पाइने छैन ।
- विषयगत प्रश्नहरूको हकमा एउटै प्रश्नका दुई वा दुई भन्दा बढी भाग (Two or more parts of a single question) वा एउटा प्रश्न अन्तर्गत दुई वा बढी टिप्पणीहरू (Short notes) सोध्न सकिने छ ।
- विषयगत प्रश्नमा प्रत्येक पत्र/विषयका प्रत्येक खण्डका लागि छुट्टाछुट्टै उत्तरपुस्तिकाहरू हुनेछन् । परीक्षार्थीले प्रत्येक खण्डका प्रश्नहरूको उत्तर सोही खण्डका उत्तरपुस्तिकामा लेख्नुपर्नेछ ।
- परीक्षाको माध्यम भाषा नेपाली वा अंग्रेजी अथवा नेपाली र अंग्रेजी दुवै हुनेछ ।
- यस पाठ्यक्रम योजना अन्तर्गतका पत्र/विषयका विषयवस्तुमा जेसुकै लेखिएको भएतापनि पाठ्यक्रममा परेका कानून, ऐन, नियम, विनियम तथा नीतिहरू परीक्षाको मितिभन्दा ३ महिना अगाडि (संशोधन भएका वा संशोधन भई हटाईएका वा थप गरी संशोधन भई) कायम रहेकालाई यस पाठ्यक्रममा परेको सम्झनु पर्दछ ।
- प्रथम चरणको परीक्षाबाट छनौट भएका उम्मेदवारहरूलाई मात्र द्वितीय चरणको परीक्षामा सम्मिलित गराइनेछ ।
- पाठ्यक्रम स्वीकृत मिति : २०८०/०३/०४

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Paper I & II: - Technical Subject

Section (A): 50% Marks
For Paper I (25 MCQs ×2 marks) &
For Paper II (4×5 marks, 3×10 marks)

1. **Electric Circuit** : Definition, Unit, Explanation and applications of Ohm's Law and Kirchhoff's Law, Connection of resistors in series, parallel and series parallel Combination
2. **Electromagnetism and Electrostatics** : Definition and formation of hysteric loop, force on a current carrying conductor placed in magnetic field, Self Inductance, Factors affecting the inductance of coil, Capacitor, Factors affecting the capacitance of capacitor, Time Constant ($T=RC$)
3. **A.C. Fundamentals** : Comparison between A.C. & D.C. Voltage and current, Generation of A. C. emf, Frequency, Angular velocity, phase & phase difference, A. C. Circuit with R. L. C. use of J-operator in circuit analysis
4. Fundamental principles of Star and Delta connection of Three phase Windings, Effect of unbalanced load in three phase system, Voltage drop, Principles and applications of Super Position Theorem, Thevenis's theorem and Norton's theorem
5. Objective of earthing of Power system, Causes of Over voltages and its protection, Neutral earthing, Body earthing, Lightning Arrestors- Types, Ratings and Characteristics, applications & locations
6. **Principles of A. C. Transformer** : Operating principle, connecting load, No load operation, Reactance, Losses and Efficiency, Cooling, Parallel operation of Single phase and Three phase transformer, Tap changing, Noises and Temperature Rise
7. **D. C. Generator** : Introduction and Principle of operation, constructional details, types, Losses and efficiency, Parallel operation of D. C. generators
8. **Ammeters and voltmeters** : Principle of operation, Power factor meter, General concept of measurement of Power, Energy, Frequency
9. Operating Principle, characteristics, construction features of Current Transformer and Potential Transformer and their application
10. General concept of load factor, maximum demand, diversity factor, system and line losses, power factor corrections, measurement of resistance, inductance and capacitance

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Section (B): 50% Marks
For Paper I (25 MCQs ×2 marks) &
For Paper II (4×5 marks, 3×10 marks)

11. **Generation of Electrical Energy** : Types of generating plants, Diesel and Hydro (Working principle, equipments, Bus bars and Reactors, Automatic Voltage Regulator, Circuit Breakers, CTs, PTs, Relays etc.)
12. Lay out concept of Sub-stations and Power-stations (Cabling, auxiliary plants-such as batteries etc., Fire protection and grounding system)
13. **Transmission Lines** : Introduction-Overhead lines and Underground cables, Types of cables, Selection of cables & Selection criteria, Mechanical and electrical design of Overhead lines, Sag, Tension, Earthling, Connection Schemes of distribution system
14. Principle of operation of D. C. Motor-Types, Torque, Losses and efficiency, speed control, speed-torque characteristics
15. Introduction and types of single-phase A. C. Motor (Motors and their characteristics for particular service-Domestic use.)
16. Introduction, Types, Constructional details and principle of operation of Synchronous Generator (Alternator) and Synchronous Motor, Parallel operation and Synchronizing of Alternator
17. Principles of Illumination (Primary and Secondary illumination, street lighting)
18. **Fundamentals of Protection Systems:** Fuses, MCB Isolators, Contactors, Circuit Breakers - Classification, Construction Operating principle
19. Principles of cost estimation of domestic power distribution application
20. **Three phase induction motor** : Construction, Principle of operation, torque speed characteristics, stand still and running condition, method of starting
21. **Basic Electronics** : Characteristics of diode, transistor and thyristor, Rectifier and filter, inverter, speed control of DC and AC motor by using thyristor
22. Refrigeration ,Heating ,Ventilation and Air Conditioning (HVAC) system
23. General information related to Shahid Gangalal National Heart Centre