Advt No. 13 of 2024

For the Post of Care Taker

Plan of Written Examination

All the aspirants are informed as under with respect to the written test to be conducted for the recruitment for the post of **Care Taker** in Advt No. 13 of 2024:-

1. *The Exam will be conducted in MCQ (Multiple Choice Questions) format. OMR sheet will be used for answering the questions.*
2. *The Exam would be of 2 hours duration.*
3. *The Exam will consist of two parts (Part A and Part B) as follows:-*

Part	Topic	No. of Questions	Marks (Each Question carries 1 mark)	Type of Questions
A	Questions from General Knowledge and Current Affairs, Punjab History and Culture, Logical Reasoning and Mental ability, Punjabi, English, ICT, (Annexure-1)	40	40	MCQs (Multiple Choice Questions)
B	Questions from the Subject (Annexure-2)	80	80	MCQs (Multiple Choice Questions)
Total		**120**	**120**	

4. **There will be negative marking. Each question carries 1 mark. For every wrong answer, 1/4th mark i.e. 0.25 mark would be deducted. The question(s) not attempted will receive no credit or discredit.**

5. For the post of Care Taker Part B contains questions from the subjects mentioned as per Annexure-2

6. Tentative syllabus for the written examination for the recruitment of **Care taker** is annexed below:

Annexure - 1

Part A - General Knowledge, *Punjab History and Culture,* Logical Reasoning Mental Ability, Punjabi, English and ICT.

Sr. No.	***Indicative Contents of Syllabus***	***Weightage (Approx.)***
1.	***General Knowledge and Current affairs of National and International importance including:*** *(i) Polity issues,* *(ii) Environment issues,* *(iii) Current Affairs,* *(iv) Science and Technology,* *(v) Economic issues,* *(vi) History of India with special reference to Indian freedom struggle movement.* *(vii) Sports,* *(viii) Cinema and Literature.* *(ix) Geography*	*10*
2.	***Punjab History and Culture:-*** *Physical features of Punjab and its ancient history. Social, religious and economic life in Punjab. Development of Language & literature and Arts in Punjab, Social and culture of Punjab during Afgan/Mughal Rule, Bhakti Movement, Sufism, Teachings/History of Sikh Gurus and Saints in Punjab. Adi Granth, Sikh Rulers, Freedom movements of Punjab.*	*5*
3.	***Logical Reasoning & Mental Ability:*** *(i) Logical reasoning, analytical and mental ability.(05 Marks)* *(ii) Basic numerical skills, numbers, magnitudes, percentage, numerical relation appreciation. (03 Marks)* *(iii) Data analysis, Graphic presentation charts, tables, spreadsheets. (02 Marks)*	*10*
4.	***ਪੰਜਾਬੀ:-*** ਸ਼ੁੱਧ-ਅਸ਼ੁੱਧ, ਸ਼ਬਦਜੋੜ, ਅਗੇਤਰ ਅਤੇ ਪਿਛੇਤਰ, ਸਮਾਨਾਰਥਕ/ਵਿਰੋਧੀਸ਼ਬਦ, ਨਾਂਵ, ਪੜਨਾਂਵ ਅਤੇ ਕਿਰਿਆ ਦੀਆਂ ਕਿਸਮਾਂ ਤੇ ਸਹੀ ਵਰਤੋਂ, ਲਿੰਗ ਅਤੇ ਵਚਨ, ਪੰਜਾਬੀ ਅਖਾਣ ਤੇ ਮੁਹਾਵਰੇ, ਅੰਗਰੇਜੀ ਤੋਂ ਪੰਜਾਬੀ ਅਨੁਵਾਦ ਅਤੇ ਬਹੁਤੇ ਸ਼ਬਦਾਂ ਦੀ ਥਾਂ ਇੱਕ ਸ਼ਬਦ ਆਦਿ।	*5*
5.	***English:-*** *Basic Grammar, Subject and Verb, Adjectives and Adverbs, Synonyms, Antonyms, One Word Substitution, Fill in the Blanks, Correction in Sentences, Idioms and their meanings, Spell Checks, Adjectives, Articles, Prepositions, Direct and Indirect Speech, Active and Passive Voice, Correction in Sentences, etc.*	*5*
6.	***ICT:-*** *Basics of computers, Network & Internet, Use of office productivity tools Word, Excel, Spreadsheet & PowerPoint.*	*5*
	Maximum Marks	**40**

Annexure-2

Part-B

Number of Questions - 80 **Maximum Marks- 80**

1. **ENGINEERING DRAWING**

Lettering techniques, Dimensioning techniques, Scales (types, R.F., length of scales), Orthographic projections and Isometric projections.

2. **ENGINEERING MATERIALS**

Ferrous Materials, Processes of Iron making and Steel making. Classification of Cast Iron and Steel. Non Ferrous Materials: Properties, Classification, Uses and alloys of Aluminium and Copper. Heat Treatment: Purpose of heat treatment, Heat treatment processes- hardening, tempering, annealing, normalizing, Case hardening and surface hardening. Plastics: Classification as thermoplastic and thermoset and their applications. Methods of Plastic coatings. Classification and Properties of Ceramics and Composites.

3. **APPLIED MECHANICS**

Laws of forces, Moment of a force, Levers: simple and compound, Couple: its properties and effects, Friction: Laws, types, calculation of frictional force. Centre of Gravity: concept and calculation. Simple Machines: simple and compound, calculation of effort, velocity ratio, mechanical advantage and efficiency.

4. **METROLOGY AND INSTRUMENTATION**

Types of Errors, Precision, accuracy, sensitivity, hysteresis, response time, repeatability, calibration, interchangeability. Linear and Angular Measurement: Verniercallipers, Micrometre, Slip gauges, Bore gauge, Bevel protector and Sine bar. Construction and Principle of operation of Mechanical comparators. Measurement of Surface Finish: Primary and Secondary texture. Concept CLA, RMS and RA value. Construction and Principle of operation of Tomlinson surface meter and Taylor surface talysurf. Measurements of Screw threads: external and core diameters, measurement of pitch and angle of threads with gauges. Construction and Principle of operation of Tool maker's microscope.

5. **WORKSHOP TECHNOLOGY**

Welding (Conventional and Modern techniques), Pattern Making, Moulding and Casting techniques and defects. Metal Forming Processes: Press Working, Forging, Rolling Extrusion and Drawing. Various types of single point cutting tools and their uses, Single point cutting tool geometry. Lathe operations:- Plain and

step turning, facing, parting off, taper turning, eccentric turning, drilling, reaming, boring, threading and knurling, form turning, spinning. Cutting parameters of lathe: Speed, feed and depth of cut for various materials and for various operations, machining time. Principle of drilling, Various operations performed on drilling machines – drilling, spot facing, reaming, boring, counter boring, counter sinking, hole milling, tapping. Speeds and feeds during drilling, Types of drills and their features, nomenclature of a drill. Principle of boring, boring tools, boring bars and boring heads. Principle of broaching, Elements of broach tool, broach tooth details, nomenclature, types, and tool material. Types of broaching machines. Grinding (Various elements of grinding wheel – Abrasive, Grade, structure, Bond. Truing, dressing, balancing and mounting of wheel. Grinding methods – Surface grinding, cylindrical grinding and centreless grinding). Ultrasonic machining (USM), Electro chemical machining (ECM), Electrical Discharge Machining (EDM), Laser beam machining (LBM) and Plasma arc machining (PAM) and welding.

6. **HYDRAULICS**

Properties of fluid: mass density, weight density (specific weight), specific volume, capillarity, specific gravity, viscosity, compressibility and surface tension. Pressure and its Measurement, Flow of Fluids, Bernoulli's theorem and its applications. Operation and application of hydraulic systems: hydraulic ram, hydraulic jack, hydraulic brake and hydraulic press. Turbines: impulse and reaction type. Construction and working of Pelton wheel, Francis turbine, Propeller and Kaplan turbines. Construction, working and operation of centrifugal pump, reciprocating pump, vane, screw and gear pumps.

7. **STRENGTH OF MATERIALS**

Concept of load, stress and strain, Elasticity, Elastic limit and limit of proportionality, fatigue, creep and stress concentration. Longitudinal and circumferential stresses in seamless thin walled cylindrical shells. Resilience, proof resilience and modulus of resilience, Strain energy due to direct stresses. Types of Beams and loads on beams, Determination of Bending Moment and Shearing Force in beams due to concentrated and U.D.L. Concept of Bending stresses, moment of resistance determination of maximum bending stress in beams of rectangular, circular, and T section. Types of columns and their modes of failure, Concept and determination of buckling load, crushing load, Slenderness ratio, Strength of column by Euler Formula and RankineGordon formula. Concept of torsion and Power transmitted by shaft, determination of twisting moment,

shear stresses using torsion equation.

8. **THERMODYNAMICS**

Fundamental Concepts i.e. Zeroth law of thermodynamics, definition of properties like pressure, volume, temperature, enthalpy, internal energy, thermodynamic systems – closed, open, isolated, adiabatic, homogeneous and heterogeneous, macroscopic and microscopic, properties of system – intensive and extensive, thermodynamic equilibrium, quasi – static process, reversible and irreversible processes, Types of thermodynamic processes – isochoric, isobaric, isothermal, hyperbolic, isentropic, polytropic and throttling processes. First law of thermodynamics and its applications. Uses of steam, classification of boilers, comparison of fire tube and water tube boilers. Construction features of Lancashire boiler, Nestler boiler, Babcock & WilcoxBoiler. Modes of heat transfer, Fourier's law, steady state conduction, Natural and forced convection. Working principle of two stroke and four stroke cycle, SI engines and CI engines, Otto cycle, diesel cycle and dual cycle. Concept of carburetion, Air fuel ratio in various engines, Working of Fuel injection pump, Common rail direct injection (CRDI). Air cooling and water cooling system, use of thermostat, radiator and forced circulation in water cooling.

9. **THEORY OF MACHINES**

Types of belt drives and types of pulleys, Concept of velocity ratio, slip and creep; crowning of pulleys, Ratio of driving tensions, power transmitted, centrifugal tension, and condition for transmission of maximum horsepower, Gear terminology, types of gears and their applications; simple and compound gear trains. Principle and applications of flywheel, Turning - moment diagram of flywheel for different engines, Fluctuation of speed and fluctuation of energy, Coefficient of fluctuation of speed and coefficient of fluctuation of energy. Principle of governor, description and working of Watt, Porter and Hartnell governor. Hunting, isochronism, stability, sensitiveness of a governor. Concept of longitudinal, transverse and torsional vibrations, Damping of vibrations.

10. **AUTOMOBILE ENGINEERING**

Clutch, Gear box, Propeller shaft, Differential, Toe in, toe out, camber, caster, kingpin inclination, Wheel balancing and alignment, Types of steering gears - worm and wheel, rack and pinion, Power steering-Hydraulic and Electrical, Braking system: mechanical, hydraulic, air and vacuum brake, Suspension System - Coil spring, leaf spring, Air suspension, Shock absorber.