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 - Subject Syllabus for the post of Technical Assistant

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

1. Electrical Fundamentals

DC Circuits: Network graph, KCL, KVL, node and mesh analysis: Transient response of dc and ac networks: Sinusoidal steady-state analysis, resonance, basic filter concepts: Ideal current and voltage sources. Average, root mean square, peak, peak to peak current values and calculations of these values, in relation to voltage, current and power; Power dissipation in L, C and R circuits; Impedance, phase angle, power factor and current calculations.

Transformer: Transformer construction principles and operation; Transformer losses and methods for overcoming them; Transformer action under load and no-load conditions; Calculation of line and phase voltages and currents; Calculation of power in a three phase system

DC Motor/Generator Theory :- Basic motor and generator theory; Operation of, and factors affecting output power, torque, speed and direction of rotation of DC motors; Series wound, shunt wound and compound motors.

AC Generators/ AC motors:- Three phase star and delta connections. Construction, principles of operation and characteristics of: AC synchronous and induction motors both single and polyphase.

2. Aerodynamics

Airflow around a body. Boundary layer, laminar and turbulent flow, free stream flow, relative airflow, upwash and downwash, vortices, stagnation;

The terms: camber, chord, mean aerodynamic chord, profile (parasite) drag, induced drag, centre of pressure, angle of attack, wash in and wash out, fineness ratio, wing shape and aspect ratio;

Thrust, Weight, Generation of Lift and Drag: Angle of Attack, Lift coefficient, Drag coefficient, polar curve, stalls;

Longitudinal, lateral and directional stability (active and passive)

3. Electronics Fundamental and Digital Techniques

Diodes and its types. Silicon controlled rectifier. Transistors and its characteristics. Description and operation of logic circuits and linear

circuits/operational amplifiers. Principles of operation and use of the following synchro system components/features: resolvers, differential, control and torque synchro.

ECAM-Electronic Centralized Aircraft Monitoring

EFIS-Electronic Flight Instrument System

GPS-Global Positioning System

TCAS-Traffic Collision Avoidance system

Special handling of components sensitive to electrostatic discharges; Awareness of risks and possible damage, component and personnel anti-static protection devices.

4. Material and Hardware

Characteristics, properties and identification of common alloy steels used in aircraft; Heat treatment and application of alloy steels; Identification of common composite and nonmetallic materials, other than wood, used in aircraft; Sealant and bonding agents.

The detection of defects/deterioration in composite and non-metallic material. Types of fabrics used in aeroplanes and defects in fabric. General understanding of Bolts, studs and screws locking devices and aircraft rivets.

5. Gas turbine Engine/ Piston engine

Compressors: - Axial and centrifugal types;

Fan balancing; Compressor stall and surge; Methods of air flow control: bleed valves, variable inlet guide vanes, variable stator vanes, rotating stator blades;

Compressor ratio. Operation and characteristics of different turbine blade types;

Operation of engine start systems and components; Ignition systems and components.

Operating principles — 2 stroke, 4 stroke, Otto and Diesel piston engine Engine Construction Crank case, crank shaft, cam shafts, sumps; Accessory gearbox; Cylinder and piston assemblies;

Operation of Supercharging/ Turbo charging

6. Propeller

High/low blade angle, reverse angle, angle of attack, rotational speed; Propeller slip;

Materials used in wooden, composite and metal propellers;

Blade station, blade face, blade shank, blade back and hub assembly;

Fixed pitch, controllable pitch, constant speeding propeller;

Propeller Synchronizing. Propeller Ice Protection. Static and dynamic balancing; Blade tracking;

7. Instrument Systems (ATA 31)

Pitot static: altimeter, air speed indicator, vertical speed indicator;

Gyroscopic: artificial horizon, attitude director, direction indicator, horizontal situation indicator, turn and slip indicator, turn coordinator; Compasses: direct reading, remote reading;

Lights (ATA 33): External: navigation, anti-collision, landing, taxiing, ice; Internal: cabin, cockpit, cargo; Emergency.

8. Aircraft Maintenance, Requirements Section 2

a) Role of International Civil Aviation Organization; The Aircraft Act and Rules made there under Role of the DGCA; Relationship between CAR-21, CAR-M, CAR-145, CAR-66, CAR-147

   The Aircraft Rules (Applicable to Aircraft Maintenance and Release)

   CAR Sections 2

   Permit to fly requirements

b) Documents:-

   Certificate of Airworthiness;

   Certificate of Registration;

   Noise Certificate;

   Weight Schedule;

   Radio Station License and Approval.

9. Human Factors

a) Human Performance and Limitations

   Vision; Hearing; Information processing; Attention and perception;

b) Social Psychology

Motivation and de-motivation; Peer pressure; 'Culture' issues; Team working;

Management, Supervision and leadership

c) Factors Affecting Performance

Fitness/health; Stress: Domestic and work related; Time pressure and deadlines;

workload: overload and under load; Sleep and fatigue, shift work; Alcohol, medication, drug abuse

d) Human Error

Error models and theories; Types of error in maintenance tasks; Implications of errors (i.e. accidents) Avoiding and managing errors

e) Hazards in the Workplace

Recognizing and avoiding hazards.