

GOVT. POLYTECHNIC DIGLIPUR

DEMO TOPICS FOR GUEST FACULTY SELECTION PROCESS FOR THE SESSION 2024-25 (ODD SEM)

S.NO.	DEPARTMENT	DEMO TOPIC	
		THEORY	PRACTICAL
1	CIVIL (GL)	Building Plan and Drawing- (a) Types of Lines (b) Principles of planning of residential & public building (c) Planning & design of doglegged staircase for residential and public buildings	Concrete Technology- (a) Test for aggregates (course & fine) (b) Test for cement (c) Test for concrete
		(a) Concrete Technology - Properties of concrete (b) Methods of testing - Mix design	Building Plan and Drawing- (a) Preparing various types of plan and section for a framed structure building (b) Working drawing of the framed structure (c) Planning of dog legged staircase for residential and public building
		Public Health Engineering- (a) Estimate the quantity water and waste water (b) Process of treatment of water and waste water (c) Physical and chemical characteristics of water and waste water	Public Health Engineering- (a) Test for portable water (common physical & chemical parameters) (b) Test for calculating optimum dosage of coagulant (c) Residual chlorine and chlorine demand test
2	CSE(GL)	DATABASE MANAGEMENT Concept of Normalization (a) Functional Dependency (b) Database Anamoly (c) Normalization types Entity & Re;ationship Model (a) Entities (b) Releationship (c) Attributes Transaction in DBMS (a) ACID properties (b) States of transaction (c) Database backup	(a) Create & execute DDL commands (b) Create & execute DML commands (c) Solve queries using operator, function etc. (d) Implement programs in C++ using array of object (e) Implement programs in C++ using constructor and destructor (f) Shell programming using if, else, for statement (g) Implement programs in C using array (h) Implement programs in C using linked list
		COMPUTER GRAPHICS Line Drawing Algorithm (a) DDA algorithm (b) Bresanham's algorithm 2-D Transformation 3-D Transformation	
		OOPS (a) Constructors and Destructors (b) Classes and Objects	
		OPEARTING SYSTEM CPU Scheduling Algorithm (a) FCFS (b) SJF (c) Priority (d) Round Robin	
		DATA STRUCTURE (a) Concept fo ADT. (b) Array (c) Linked List	

3	EE (GL)	Mesh/ Nodal Analysis	Verification of Kirchoff's laws
		RLC series circuit & circuit resonance	Measurement of power in single phase AC circuit
		Measurement of single phase power using dynamometer wattmeter	Measurement of three phase power by two wattmeter method
		Construction and working principle of transformer	Determine the magnetising characteristic of an alternator at different loads
		parallel operation of transformer	Open circuit and short circuit test of single phase transformer to determine efficiency
		SF6 Circuit Breaker	Load test on three phase induction motor to determine efficiency
		Construction and working of Buchholz Relay	Perform an experiment to reverse the direction of DC Shunt motor
		Different types of line insulators in transmission & distribution system	Staircase wiring & Go down wiring
		Different types of single phase induction motors	Wiring of electrical circuit to control lamp, fan and socket on wiring practice board
		Over current and earth fault protection of alternators	Starting and running of single phase induction motor in forward & reverse direction
4	ECE (GL)	DIGITAL TECHNIQUES (a) Boolean Algebra: Laws of Boolean algebra, Duality theorem, De Morgan's Theorem (b) Encoder/Decoder: Basic of encoder decoder, comparison (IC7447) BCD to 7 segment decoder/Driver (c) SR flip flop: SR flip flop, clocked SR flip flop with preset and clear, drawback of SR flip flop	(a) Design full adder and full subtractor (b) Build /test function of RS flip flop using NAND gate (c) Build R2-R resistive network on breadboard to convert given digital data into analog. (d) Construct S-R, J-K, D and T flip flop and verify truth table
		BASIC ELECTRICAL & ELECTRONICS ENGG (a) Active and passive components; resistor, capacitor, inductor, symbol, colour code, specification. (b) voltage and current sources. (c) Integrated circuit-Analog and Digital (d) Input and Output characteristic: CE, CB and CC configuration. (e) Transistor Parameter: CB gain α , CE gain, input resistance, output resistance, relation, relation between α and β	(a) Test the performance of PN junction Diode. (b) Determine the value of given resistor using Digital multimeter to confirm with colour code (c) Test the performance of NPN transistor. (d) Test the performance of transistor as switch circuit. (e) Test the performance of transistor amplifier circuit.
		EMBEDDED SYSTEM (a) Feature of 89C51, PIC, AVR and ARM microcontroller with their application (b) Classification of embedded system: small scale, medium scale, sophisticated stand-alone, reactive /real time (soft and hard real time) (c) interrupt control program with 'embedded C' for given microcontroller (d) Max 232 as a bidirectional level converter (e) Features of RTOS: watch dog timer, semaphore	(a) Execute the 'C' program to perform following arithmetic operation on 8-bit data: addition, subtraction, multiplication. (b) Develop and test the 'C' program to perform data transfer from source to destination (use internal data memory location) (c) Interface RS 232 connector to PC using MAX 232 IC. (d) Identify the pin of 8051 and AVR microcontroller.
		ELECTRONICS MEASUREMENTS & INSTRUMENTATIONS (a) Fundamentals of Electronics measurements (b) Calibration : Need and meaning of calibration (c) CRO: Block diagram of CRO, CRT, vertical deflection system and horizontal deflection system, need of delay line, time base generator, amplitude and frequency measuring using CRO, Lissajous pattern for phase and frequency measurement	(a) Test the characteristic of potentiometer. (b) Use thermocouple to measure temperature of given liquid. (c) Use RTD (Pt-100) to measure temperature of given liquid.
5	MATHS (GL)	1. Differentiation of implicit function 2. Lagrange method of undetermined multipliers 3. Area by double integration and volume by triple integration 4. First order linear differential equations 5. Partial fraction of proper and improper fraction. 6. Reduction of quadratic form into conical by orthogonal transformation 7. Expansion of periodic function into Fourier series 8. Solutions of linear simultaneous in the three variables by Cramer's rule. 9. Point of intersection of two lines, equation of line passing through point of intersection with given condition 10. Fourier's Transforms and its inverse	

6	Physics (GL)	<ol style="list-style-type: none"> 1. Ultrasonic Wave Production 2. Lasers and fibre optics 3. Air wedge- Michelson's interferometer 4. concept of double refraction 5. Nanomaterials- its synthesis, Properties and Application 6. Non destructive testing of materials 7. Nuclear Reactor 8. Application of Hall effect in the semiconductor 9. Super conductors and its application 10. Magnetic field and magnetic field Intensity 	<ol style="list-style-type: none"> 1. To study the coefficient of thermal conductivity of bad conductor by using Lee's disc method/ 2. Determination of thickness of given piece of sample by airwedge method 3. Determination of wavelength of monochromatic light by using diffraction grating 4. Determination of elasticity of a metallic wire by using searle's apparatus 5. Determination of law resistance by using meter bridge \determination of velocity of sound by resonance column 6. To determine the radius of curvature of a planoconvex lens using newton's ring apparatus 7. To determine the refractive index of glass prism by using Pin method 8. To determine the buoyancy force on solid immersed in liquid(Archemedies principle) 9. To determine the internal resistance of primary cell by using potentiometer 10. To calculate the magnetic moment and polestreth of a bar magnet by using vibration magnetometer.
7	Chemistry (GL)	<ol style="list-style-type: none"> 1. Conducting polymers – classification and application 2. Protective coating and its types in terms of corrosion 3. Vulcanization –Synthetic Rubber 4. Super conductivity 5. Desalination process- reverse osmosis and Electrolysis 6. Moulding constituent of plastics and moulding techniques 7. Different types of crystal structures with angle. 8. Qualitative idea of line, point surface and volume defect 9. How to calculate Co-ordination number and atomic radius of FCP and HCC unit cells 10. Dielectric polarization and Mechanism 	<ol style="list-style-type: none"> 1. To determine the pH value of solution using pH meter and universal Indicator 2. Determine thinner content in oil paint 3. Estimation of vinegar 4. Estimation of available chlorine in Bleaching powder 5. Estimate the chlorine content of given water sample 6. Estimation of magnesium by EDTA 7. Determination of carbonates and bi carbonates in water 8. determination of percentage of iron present given Hematite ore. by KMnO₄ Solytion 9. Determination of Hardness of the sample water by EDTA method 10. Estimation of ferrous by permagnometry