



BALUCHISTAN PUBLIC SERVICE COMMISSION

MCQs Test for the Post of LECTURER (TECHNICAL)(CIVIL) (B-17)

In the Technical Wing of Colleges, Higher & Technical Education Department

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- 1) In the context of organizational behavior, "Maslow's Hierarchy of Needs" theory suggests that human needs are arranged in a hierarchy, with the most basic needs being:
a) Esteem needs. b) Self-actualization needs. c) Physiological needs. d) Social needs.
- 2) "Job enrichment" is a management technique designed to:
a) Increase the number of tasks an employee performs. b) Increase the depth of the job by adding more responsibility and autonomy. c) Reduce the workload of the employee. d) Increase the salary of the employee.
- 3) "Groupthink" is a phenomenon that occurs when:
a) A group makes a highly rational and well-analyzed decision. b) The desire for harmony and conformity in a group leads to an irrational decision. c) A group leader dominates the decision-making process. d) The group is highly diverse in its thinking.
- 4) As per the Working Stress Method, the "modular ratio" (m) is defined as the ratio of:
a) The modulus of elasticity of steel to the modulus of elasticity of concrete. b) The permissible stress in steel to the permissible stress in concrete. c) The modulus of elasticity of concrete to the modulus of elasticity of steel. d) The stress in concrete to the stress in steel.
- 5) The "critical neutral axis" in an RCC beam section corresponds to the condition when:
a) The steel reaches its yield stress and the concrete reaches its ultimate crushing strain simultaneously. b) The steel reaches its yield stress first. c) The concrete reaches its ultimate crushing strain first. d) The stresses in steel and concrete are equal.
- 6) The minimum area of tension reinforcement in an RCC beam, as per most standard codes, is provided to:
a) Increase the moment of resistance of the beam. b) Prevent sudden brittle failure. c) Reduce the deflection of the beam. d) Resist the shear force.
- 7) In highway engineering, the "stopping sight distance" (SSD) is the sum of:
a) The perception-reaction distance and the braking distance. b) The overtaking distance and the safe lateral clearance. c) The braking distance and the skid distance. d) The perception-reaction distance and the overtaking distance.
- 8) The "superelevation" on a horizontal curve is provided to:
a) Counteract the centrifugal force acting on the vehicle. b) Improve the drainage of the road surface. c) Increase the friction between the tire and the road. d) Reduce the length of the curve.
- 9) The "level of service" (LOS) for a highway is a qualitative measure that describes the:
a) Physical condition of the pavement surface. b) Operational conditions of the traffic stream. c) Number of lanes on the highway. d) Safety features on the highway.

- 10) The "unit hydrograph" is defined as the hydrograph resulting from:
- A unit depth of rainfall excess occurring uniformly over the watershed at a constant rate for a specified duration.
 - A unit depth of total rainfall occurring over the watershed for an infinite duration.
 - The maximum rainfall intensity for a given return period.
 - The average annual rainfall over the watershed.
- 11) The "infiltration capacity" of a soil is defined as the:
- Maximum rate at which water can enter the soil surface.
 - Total volume of water that can be stored in the soil profile.
 - Rate at which water moves through the saturated zone.
 - Amount of water lost to the atmosphere by evapotranspiration.
- 12) The "S-curve" method in hydrograph analysis is used to:
- Convert a unit hydrograph of one duration to another duration.
 - Determine the peak discharge of a flood.
 - Calculate the time of concentration.
 - Estimate the direct runoff volume.
- 13) The "stiffness factor" for a member in the moment distribution method, when the far end is fixed, is:
- $2EI/L$
 - $3EI/L$
 - $4EI/L$
 - $6EI/L$
- 14) In plastic analysis, the shape factor for a rectangular cross-section is:
- 1.13
 - 1.50
 - 1.70
 - 2.00
- 15) The carry-over factor in the moment distribution method for a member with a fixed far end is:
- 0
 - 0.5
 - 1.0
 - 0.25
- 16) The "void ratio" of a soil is defined as the ratio of the:
- Volume of voids to the volume of solids.
 - Volume of voids to the total volume of soil.
 - Weight of water to the weight of solids.
 - Volume of solids to the volume of voids.
- 17) The "bearing capacity" of a soil is the:
- Maximum pressure a soil can sustain without shear failure.
 - Total load a foundation can transmit to the soil.
 - Settlement of a foundation due to the applied load.
 - Shear strength of the soil.
- 18) The "Terzaghi's bearing capacity equation" is applicable to:
- Cohesive soils only.
 - Granular soils only.
 - Both cohesive and granular soils.
 - Rock only.
- 19) In a flat slab system, the primary structural purpose of providing a "drop panel" is to:
- Enhance the aesthetic appearance of the soffit.
 - Increase the shear strength and moment capacity at the column support.
 - Provide a level surface for the ceiling finishing.
 - Reduce the quantity of steel required in the slab.
- 20) A "two-way slab" is a slab in which the:
- Load is transferred in one direction to the supporting beams.
 - Load is transferred in both directions to the supporting beams.
 - Slab is supported on all four sides.
 - Slab has a span-to-depth ratio less than 2.
- 21) In concrete technology, the "aggregate Impact value" (AIV) is a measure of the aggregate's resistance to:
- Gradual compressive loading.
 - Abrasion and wear.
 - Sudden shock or impact.
 - Chemical weathering.

- 22) The phenomenon of "efflorescence" in bricks is primarily caused by the presence of:
 a) Excessive alumina in the clay. b) Soluble salts in the brick or mortar. c) Incomplete burning of the brick. d) High silica content in the clay.
- 23) The "initial setting time" of Ordinary Portland Cement is primarily governed by the addition of:
 a) Gypsum during the grinding process. b) Tri-calcium aluminate (C_3A) content. c) Di-calcium silicate (C_2S) content. d) Ferrite (C_4AF) content.
- 24) The Laplace transform of the function $f(t) = e^{at} \cos(bt)$ is:
 a) $(s+a) / [(s+a)^2 + b^2]$ b) $b / [(s+a)^2 + b^2]$ c) $(s-a) / [(s-a)^2 + b^2]$ d) $b / [(s-a)^2 + b^2]$
- 25) The solution to the differential equation $dy/dx + y \cdot \cot(x) = \csc(x)$ is:
 a) $y \cdot \sin(x) = \ln(\csc x - \cot x) + C$ b) $y \cdot \cos(x) = \sin(x) + C$ c) $y \cdot \sin(x) = x + C$ d) $y \cdot \cos(x) = \ln(\sec x + \tan x) + C$
- 26) The value of the double integral $\int_0^1 \int_0^1 1/(1-xy) dx dy$ is:
 a) $\pi^2/6$ b) $\pi^2/4$ c) $\pi^2/12$ d) $\pi^2/8$
- 27) In chain surveying, if the chain used is too short, the measured length of a line will be:
 a) Equal to the true length. b) Greater than the true length. c) Less than the true length. d) Unpredictable.
- 28) The "reduced level" (RL) of a point is its:
 a) Vertical distance above or below a horizontal datum. b) Height above the mean sea level only. c) Horizontal distance from the instrument station. d) Elevation with respect to an arbitrary temporary benchmark.
- 29) The process of "interpolation" in contouring is used to:
 a) Determine the horizontal distance between contour lines. b) Locate points of equal elevation between two known points. c) Calculate the area of the contour map. d) Determine the slope of the ground.
- 30) The "Mohs scale of hardness" is used to classify minerals based on their:
 a) Resistance to scratching. b) Cleavage characteristics. c) Specific gravity. d) Reaction to acid.
- 31) A "fault" in geological terminology is a fracture in the Earth's crust along which:
 a) No displacement has occurred. b) Displacement has occurred parallel to the fracture surface. c) Displacement has occurred perpendicular to the fracture surface. d) Magma has been intruded.
- 32) The "unconfined compressive strength" of a rock specimen is a measure of its:
 a) Resistance to tensile failure. b) Resistance to shear failure. c) Resistance to axial compressive failure without lateral confinement. d) Resistance to impact loading.
- 33) In tacheometric surveying, the horizontal distance between the instrument and the staff is determined by:
 a) The stadia interval and the multiplying constant. b) The vertical angle and the slope distance. c) The chain and tape measurement. d) The theodolite horizontal angle.
- 34) The "closing error" in a traverse survey is the:
 a) Difference between the measured and calculated bearing of the closing line. b) Sum of the interior angles minus the theoretical sum. c) Linear misclosure of the traverse. d) Difference between the forward and backward bearings of a line.

- 35) In trigonometric levelling, the "coefficient of refraction" is considered to account for the:
- Curvature of the Earth's surface.
 - Bending of the line of sight due to atmospheric density variations.
 - Error in the vertical circle reading.
 - Error in the staff reading.
- 36) In engineering economics, the "time value of money" implies that:
- Money loses its purchasing power over time due to inflation only.
 - A sum of money today is worth more than the same sum in the future.
 - Money has a constant value over time.
 - The value of money is independent of the interest rate.
- 37) The "benefit-cost ratio" (BCR) method for project evaluation is used to determine:
- The net present value of the project.
 - The ratio of the present worth of benefits to the present worth of costs.
 - The internal rate of return of the project.
 - The payback period of the investment.
- 38) "Depreciation" in accounting refers to:
- The decrease in the market value of an asset due to wear and tear.
 - The allocation of the cost of a tangible asset over its useful life.
 - The increase in the value of an asset due to inflation.
 - The maintenance cost of an asset.
- 39) In the "long wall and short wall" method of estimation, the quantity of brickwork is calculated by:
- Multiplying the total length of the wall by its height and thickness.
 - Separately calculating the quantities for the long walls and short walls.
 - Calculating the area of the wall and multiplying by the thickness.
 - Using the center-line method for all walls.
- 40) The "lead" in earthwork estimation refers to the:
- Vertical distance the excavated material is lifted.
 - Horizontal distance the excavated material is carried.
 - Depth of the excavation.
 - Width of the trench.
- 41) In the design of a "footing" for an RCC column, the critical section for bending moment is taken at the:
- Centerline of the column.
 - Face of the column or pedestal.
 - Edge of the footing.
 - Midpoint between the column face and the edge of the footing.
- 42) In remote sensing, the "spatial resolution" of a satellite sensor refers to its ability to:
- Distinguish between different wavelengths of light.
 - Distinguish between two closely spaced objects on the ground.
 - Detect objects at different depths.
 - Capture images at different times.
- 43) The "Global Positioning System" (GPS) operates on the principle of:
- Triangulation using signals from satellites.
 - Interferometry using radio waves.
 - Photogrammetry using aerial photographs.
 - Sound navigation and ranging.
- 44) In Geographic Information Systems (GIS), "buffering" is a spatial analysis operation that:
- Classifies the data into different categories.
 - Creates a zone of a specified distance around a feature.
 - Overlays two different layers of data.
 - Calculates the area of a polygon.
- 45) In an open channel, the "specific energy" is defined as the energy per unit weight of the liquid measured with respect to the:
- Channel bed.
 - Free surface.
 - Horizontal datum.
 - Critical depth.
- 46) The "Froude number" (Fr) in an open channel flow is defined as the ratio of:
- Inertial forces to viscous forces.
 - Inertial forces to gravity forces.
 - Viscous forces to gravity forces.
 - Pressure forces to inertial forces.

- 47) The "duty of water" in irrigation is defined as the:
- a) Area of land that can be irrigated per unit volume of water.
 - b) Depth of water required by the crop during its entire growing season.
 - c) Period between two successive irrigations.
 - d) Ratio of the water delivered to the crop to the water required.
- 48) The "canons of ethics" for professional engineers primarily emphasize:
- a) Maximizing the profit for the employer.
 - b) Upholding the safety, health, and welfare of the public.
 - c) Protecting the reputation of the engineering profession.
 - d) Ensuring technical competence only.
- 49) A "conflict of interest" in engineering practice occurs when:
- a) Two engineers disagree on a technical solution.
 - b) A professional's personal interests could influence their professional judgment.
 - c) An engineer works for more than one client.
 - d) An engineer is asked to work overtime.
- 50) "Whistleblowing" in the context of professional ethics refers to:
- a) Reporting misconduct or unethical behavior within an organization.
 - b) Promoting the positive achievements of the organization.
 - c) Publicizing the company's products.
 - d) Resolving workplace disputes.
- 51) According to Lami's theorem, if three coplanar forces act on a particle and are in equilibrium, each force is proportional to the sine of the:
- a) Angle between the other two forces.
 - b) Angle between the force and the horizontal.
 - c) Angle between the force and the vertical.
 - d) Complementary angle of the force.
- 52) The "moment of inertia" of a body about an axis is a measure of its:
- a) Mass.
 - b) Resistance to angular acceleration.
 - c) Resistance to linear acceleration.
 - d) Center of gravity.
- 53) In an orthographic projection, the front view of an object is obtained by projecting the object onto a plane that is:
- a) Parallel to the horizontal plane.
 - b) Parallel to the vertical plane.
 - c) Perpendicular to the horizontal plane.
 - d) Inclined at 45 degrees.
- 54) A "sectional view" in an engineering drawing is used to:
- a) Show the external appearance of the object.
 - b) Show the internal details of the object that are not visible from the outside.
 - c) Show the dimensions of the object.
 - d) Show the assembly of different parts.
- 55) In "triangulation" surveying, the primary objective is to:
- a) Measure the horizontal distances accurately.
 - b) Determine the elevations of points.
 - c) Establish a framework of control points by measuring angles.
 - d) Map the topography of the area.
- 56) The "least count" of a vernier theodolite is the:
- a) Maximum angle that can be measured.
 - b) Smallest angle that can be accurately read.
 - c) Diameter of the horizontal circle.
 - d) Magnification of the telescope.
- 57) A "bulldozer" is a piece of earthmoving equipment primarily used for:
- a) Excavating trenches and foundations.
 - b) Dozing and pushing earth, and clearing sites.
 - c) Loading earth into trucks.
 - d) Compacting soil and gravel.

- 58) In a construction project, the "critical path" in a network diagram is the:
- Path with the minimum total duration.
 - Path with the maximum total duration.
 - Path that contains the most number of activities.
 - Path that is least sensitive to delays.
- 59) The "Chemical Oxygen Demand" (COD) of a wastewater sample is a measure of the:
- Oxygen required to biologically oxidize organic matter.
 - Oxygen equivalent of the organic matter that is chemically oxidizable.
 - Dissolved oxygen present in the wastewater.
 - Suspended solids concentration.
- 60) In water treatment, "coagulation" is the process of:
- Settling of suspended particles by gravity.
 - Destabilizing the colloidal particles to promote their aggregation.
 - Removing dissolved gases from the water.
 - Disinfecting the water.
- 61) "Quality assurance" in construction projects is defined as:
- The process of inspecting the finished product to ensure it meets specifications.
 - The systematic process of ensuring that the project meets the specified quality requirements.
 - The process of correcting defects in the construction work.
 - The process of selecting the cheapest materials for the project.
- 62) The Newton-Raphson method for finding the root of an equation is based on:
- The principle of bisection.
 - The use of the secant line.
 - The Taylor series expansion.
 - The interpolation of a polynomial.
- 63) The order of convergence of the Newton-Raphson method for a simple root is:
- Linear.
 - Quadratic.
 - Cubic.
 - Exponential.
- 64) The Gauss-Seidel method is an iterative technique used to solve:
- Systems of linear equations.
 - Systems of non-linear equations.
 - Differential equations.
 - Integral equations.
- 65) The "Biochemical Oxygen Demand" (BOD) of a wastewater sample is a measure of the:
- Total organic matter present in the water.
 - Oxygen required by microorganisms to stabilize biodegradable organic matter.
 - Oxygen equivalent of the inorganic chemicals present.
 - Dissolved oxygen present in the water.
- 66) The "turbidity" of water is primarily caused by the presence of:
- Dissolved salts.
 - Suspended colloidal particles.
 - Pathogenic bacteria.
 - Dissolved gases.
- 67) In a slow sand filter, the "schmutzdecke" is the:
- Under-drainage system.
 - Biological layer formed on the sand surface.
 - Filter media.
 - Backwashing mechanism.
- 68) If A and B are two independent events with $P(A) = 0.6$ and $P(B) = 0.4$, then $P(A \cap B)$ is:
- 0.24
 - 0.36
 - 0.16
 - 0.60
- 69) The "standard deviation" of a data set is a measure of its:
- Central tendency.
 - Variability or dispersion.
 - Skewness.
 - Kurtosis.
- 70) In a normal distribution, approximately what percentage of the data falls within two standard deviations ($\pm 2\sigma$) of the mean?
- 68.27%
 - 95.45%
 - 99.73%
 - 100.00%