GUJARAT TECHNOLOGICAL UNIVERSITY

BE-3 SEMESTER – OLD PAPER – S22 TO W25 – QUESTION BANK ANSWER

Subject Name & Code:

BUILDING AND TOWN PLANNING (3130609)

(Disclaimer: The purpose of these AI-generated responses is just education and reference. Utilize them to grasp topics and structure, but always rewrite in your own words and double-check)

UNIT 2 – Building Bye-Laws, NBC, RERA, ODPS, Earthquake Resistant Planning

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Q.1 – Write short note on ODPS (Online Development Permission System). (7 marks)
Appeared in: S25 (7m), S23 (7m), W25 (3m), W24 (3m), W23 (3m)
Ans:
ODPS is a web-based platform for submitting, tracking, and approving building plan applications online.
Key features:

- **Paperless submission** – Upload drawings, documents, fees.
- **Auto-scrutiny** – Rule-based checking of setbacks, FAR, height against bye-laws.
- **Real-time tracking** – Applicant knows status (under scrutiny, approved, rejected).
- **Digital signature** – Legally valid approvals.
- **Transparency** – Reduces corruption and delays.

Advantages:

- Faster approval (weeks → days).
- Single window for multiple departments (fire, pollution, airport authority).
- Data repository for town planning.

Real-world application: Implemented in Gujarat (by Gujarat Infrastructure Development Board) – reduced approval time from 90 to 30 days.
[DG PROMPT – ODPS workflow]
Title: ODPS Process Flow
Description: Flowchart with boxes: "Applicant uploads plan" → "Auto-scrutiny against bye-laws" → "If deviations → reject with reasons" → "If passed → forward to human officer" → "Approval with digital signature" → "Download permit". Arrows connecting boxes.

Q.2 – Explain objectives/necessity of ODPS. (4 marks)
Appeared in: S24 (4m)
Ans:
Objectives / Necessity of ODPS:

1. **Minimise human intervention** – Eliminate bribery and discretion.
2. **Speed up clearances** – Auto-scrutiny of standard rules (setback, FAR).
3. **Uniformity** – Same software applies same bye-laws across the state.
4. **Accountability** – Each action is logged with date/time stamp.
5. **Data collection** – Centralised database for town planning analysis.

Without ODPS, builders face delays, harassment, and higher costs.

Q.3– Explain principles of planning in detail. (7 marks)
Appeared in: S25 (OR 7m), S23 (7m), W24 (7m)
Ans:
Principles of planning (detailed):

1. **Aspect** – Positioning rooms to get sun, breeze, and views.
    - Kitchen: east; living: north; bedrooms: south-east.
2. **Prospect** – Pleasant external views (garden, road) while avoiding undesirable sights (dustbin,

drain).
3. **Privacy** – Visual and acoustic separation.
    - Toilets not opening into living; bedrooms at rear; high boundary walls.
4. **Roominess** – Illusion of larger space using light colours, mirrors, continuous flooring.
5. **Grouping** – Arranging rooms functionally (kitchen near dining, toilets near bedrooms).
6. **Circulation** – Horizontal (corridors) and vertical (stairs) movement. Minimum width 1 m.
7. **Sanitation** – Proper drainage, water supply, garbage disposal, ventilation of toilets.
8. **Flexibility** – Design for future modifications (e.g., partition walls, convertible rooms).
9. **Economy** – Avoid wasteful circulation area; optimum use of space.
10. **Climate responsiveness** – Sun shading, overhangs, cross ventilation.

Real-world application: Passive solar homes in Ladakh use aspect and roominess to trap heat.

Q.4 – How building is made earthquake resistant using construction techniques? (7 marks)
Appeared in: S23 (4m), W24 (7m), W23 (7m), W22 (7m)
Ans:
Earthquake resistant techniques:

1. **Lightweight materials** – Use of hollow blocks, wooden frames instead of heavy masonry.
2. **Reinforced concrete frames** – Ductile detailing (IS 13920) – closed stirrups, no hooks at 135°.
3. **Shear walls** – Concrete walls around lift cores and staircases to resist lateral forces.
4. **Bracing** – Steel cross-bracing in columns.
5. **Base isolation** – Lead-rubber bearings between foundation and superstructure.
6. **Band beams** – Horizontal RC bands at plinth, lintel, roof level in masonry buildings.
7. **Through-stones** – Interlocking stones in stone masonry.
8. **Separation joints** – Gaps (10-20 mm) between adjacent blocks to avoid pounding.

Real-world application: Bhuj (2001) reconstruction used RC frames with ductile detailing – buildings survived 2005 Kashmir earthquake.
[DG PROMPT]
Title: Ductile detailing of beam-column joint
Description: Draw a right-angle joint. Column vertical bars, beam horizontal bars. Show closed stirrups in beam near column (spacing 100 mm). Show additional stirrups in column above and below beam. Label "135° hook". Show arrow "Seismic load direction".

Q.5 – Explain key features of RERA Act / influence of RERA in real estate. (7 marks)
Appeared in: W25 (4m), W22 (OR 7m)
Ans:
RERA (Real Estate (Regulation and Development) Act, 2016)
Key features:

- **Mandatory registration** – All projects > 500 m² or > 8 apartments must register with RERA.
- **Escrow account** – 70% of buyers' money must be kept in a separate bank account, used only for construction.
- **Timely possession** – Builder must state completion date; delay requires compensation.
- **Standardised agreement** – No unilateral changes in carpet area or layout.
- **Defect liability** – 5 years for structural defects.
- **Website** – All project details (layout, approvals, status) publicly available.

Influence on real estate:

- Increased transparency – buyers now check RERA registration.
- Reduced project delays – builders penalised for late delivery.
- Consolidation – small, unorganised builders left market.
- Boosted buyer confidence – housing sales increased after RERA.

Real-world application: Many stalled projects (e.g., Jaypee Infratech) revived due to RERA intervention.

Other Important Questions (Unit 2)

Q.6 – Write short note on "Software for ODPS". (7 marks)
Appeared in: W22 (7m)
Ans:
Software used in ODPS:

- **AutoCAD / DXF-to-PDF converter** – For drawing submission.
- **Rule engine** (e.g., OpenRules, Drools) – Codifies bye-laws (setback, FAR, height).
- **Geospatial engine** (GIS) – Overlays plot on base map, checks land use.
- **Workflow engine** (e.g., Activiti) – Routes application to different departments.
- **Digital signature integration** (e.g., eMudhra, CCA India).
- **Payment gateway** – Online fee collection.

Example: Gujarat's ODPS uses "G-SWAN" (Gujarat State Wide Area Network) with a custom .NET application.

Q.7 – Explain planning of earthquake resistant building / general principles. (7 marks)
Appeared in: S23 (4m), W24 (7m)
Ans:
General principles (planning stage):

1. **Simple rectangular shape** – Avoid L, T, U shapes (stress concentration at re-entrant corners).
2. **Symmetry** – Mass and stiffness evenly distributed.
3. **Low height-to-width ratio** – Avoid slender buildings.
4. **Light roof** – Use CGI sheets or wood instead of heavy concrete.
5. **Short columns** – Avoid mezzanine floors creating short columns (brittle failure).
6. **Foundation** – Firm, uniform soil (avoid soft storey on ground floor).
7. **Separation joints** – Divide long building into blocks.

These principles are implemented in the **IS 1893 (Part 1)** seismic design code.

Q.8 – Define terms: FSI, RERA, Set-back. (4 marks)
Appeared in: W22 (4m)
Ans:

- **FSI (Floor Space Index)** = Same as FAR. Total floor area / Plot area. Example: FSI 2 on 100 m^2 → 200 m^2 permissible.
- **RERA** – Real Estate (Regulation and Development) Act, 2016; regulates real estate sector, protects buyers.
- **Set-back** – Minimum open space around building. Functions: light, ventilation, fire safety, future road widening.

Q.9 – Explain the importance of building bye-laws and local regulations. (3 marks)
Appeared in: W25 (3m)
Ans:
Importance:

- **Safety** – Prevents collapse, fire hazards.
- **Public health** – Ensures sewage, water supply, garbage disposal.
- **Orderly growth** – Avoids slums, encroachments.
- **Legal clarity** – Defines rights of owner and neighbour (e.g., no window facing neighbour's wall within 1 m).
- **Disaster mitigation** – Earthquake, flood, cyclone provisions.

Q.10 – What is NBC? How is it helpful in planning and design of buildings? (7 marks)
Appeared in: S25 (OR 7m), W23 (4m)
Ans:
NBC (National Building Code of India) – A comprehensive code by BIS covering structural safety, fire protection, building services, plumbing, electrical, and materials.
Helpfulness in planning & design:

- **Architectural planning** – Gives room dimensions, staircase widths, corridor widths (Section

3).

- **Structural design** – Provides load combinations, seismic zones (IS 1893, IS 456).
- **Fire safety** – Travel distance, staircase enclosures, fire extinguishers (Part 4).
- **Plumbing** – Water demand, drainage pipe slopes (Part 9).
- **Accessibility** – Ramps, lifts for disabled (Part 3, Annex E).
- **Energy efficiency** – Building envelope U-values, solar orientation (NBC 2016 update).

Using NBC ensures that a building meets **minimum acceptable standards** across India, even if local bye-laws are silent.

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