Roll Number .....

**CIVIL SERVICE COMMON EXAMINATIONS**
**FOR TECHNICAL GRADUATES**
**16th November 2007**

# Paper III: Subject: ARCHITECTURE

**Time allowed:** 2.5 Hours
**Total Marks:** 100

## READ THE INSTRUCTIONS GIVEN VERY CAREFULLY!!!

### 1. General Instructions:

1.1 Do not write anything during the first 15 minutes. This time is to be spent on reading the instructions and the questions and for clearing any misprints/clarifications.

1.2 Any misprints/clarification in the Question book must be raised in the first 15 minutes.

1.3 Under the provisions of the Civil Service Common Examinations Procedures, candidates shall write their given Roll Number only in the space provided in the question/answer book. Write your roll number in the space provided in **all** the pages of this book

1.4 No other particulars which would indicate the identity of the candidate shall be written on this book. Any candidate found guilt of writing particulars shall be immediately disqualified from consideration for future employment.

1.5 This book is the property of the Royal Civil Service Commission and shall not be removed from the Examination hall. No pages shall be removed or torn from this book. Any pages found missing shall be reported to the invigilators within the first 15 minutes of receipt of the book.

1.6 Candidates will not be allowed to carry any papers or any other information device inside the Examination Hall.

1.7 Candidates will be required to produce the Admit Card while entering the Examination hall and as and when demanded by the concerned authorities.

1.8 Candidates will be allowed to leave the Examination Hall only after the full 2.5 hours time given for the Examination is completed. If you finish answering the questions before the allotted time, the candidate must sit quietly until the allotted time is over.

### 2 Specific instructions

2.1 All answers must be written in black or blue ink. Drawings can be done with pencils and colour where applicable.

2.2 Calculators/mobile phones are not permitted.

2.3 Normal scale rulers and drafting pencils are permitted.

2.4 All answers must be written neatly and legibly. Illegible writing will not be accepted or marked.

2.5 There are **3 Sections of Questions** in this Paper. Read and follow the instructions on how to answer each Section of Questions very carefully!

Roll Number .....

**CIVIL SERVICE COMMON EXAMINATIONS FOR TECHNICAL GRADUATES**
**Paper III: Subject: Architecture**

## SECTION 1: MULTIPLE CHOICE QUESTIONS

(One mark for each Question - 30 questions)

**Instructions: Answer all questions in this Section**
**Underline (very neatly) the right answers in this Section**

### 1. ARCHITECTURAL ELEMENTS

**Q1.** A high wall with a band of narrow windows along the very top which usually rises above adjoining roofs is termed as

a) A dormer
b) A clerestory
c) A frieze
d) An oriel

**Q2.** A hip roof

a) slopes down on all fours sides of a building
b) slopes across the four sides of a building
c) slopes down on three sides of a building
d) slopes down on two sides of a building

**Q3.** Boards, often elaborately carved, which hang from the projecting ends of a roof are normally called

a) a siding board
b) a veriticul board
c) a roof edge board
d) a bargeboard

**Q4.** A projecting support built into or against the external wall of a building, typically used in Gothic buildings is usually called a

a) gotho
b) buttress
c) balustradial
d) projectory

**Q5.** Often found in religious buildings, a cloister is

a) a long courtyard with windows
b) a covered circular space inside the main building
c) a courtyard with covered walks
d) a courtyard surrounding all sides of the main building

**CIVIL SERVICE COMMON EXAMINATIONS FOR TECHNICAL GRADUATES**
**Paper III: Subject: Architecture**

## 2. BUILDING MATERIALS

**Q6.** Adobe is a building material term used for

a) Rammed earth
b) Shaped earth bricks
c) pouring earth mixed water into formwork
d) earth built in monolithic form

**Q7.** Cement and concrete products require the introduction of water

a) to create a chemical reaction which mixes the ingredients together
b) to create a chemical reaction which allows the ingredients to settle
c) to create a chemical reaction which binds the ingredients together
d) to create a chemical reaction which makes the ingredients runny

**Q8.** In compression and tension, timber is strongest

a) in the direction of the growth
b) in the opposite direction of the growth
c) in the direction parallel to the top
d) in the direction of the horizontal direction of the tree

**Q9.** Stones generally have good

a) tensile strength
b) kinetic strength
c) compressive strength
d) tenon strength

**Q10.** Heat absorbed by building materials is normally stored until

a) the ambient temperature equals the temperature of the material
b) the ambient temperature drops below the temperature of the material
c) the ambient temperature drops above the temperature of the material
d) the ambient temperature drops above the temperature of the surroundings

CIVIL SERVICE COMMON EXAMINATIONS FOR TECHNICAL GRADUATES
Paper III: Subject: Architecture

## 3. STRUCTURAL PRINCIPLES AND ANALYSIS

**Q11.** Most framed structures (eg. trusses) are designed as

a) pin-jointed frames
b) double jointed frames
c) post-jointed frames
d) pillar jointed frames

**Q12.** The load that is applied continuously during the life of a building and are the most accurately estimated of loads are

a) Live load
b) Furniture load
c) Shedding load
d) Dead load

**Q13.** When the applied force lies in the same plane as a wall and the wall is stressed

a) in stress
b) in shear
c) in lateral
d) in horizontal

**Q14.** The Bending Moment at a point in a beam is important because it measures the total bending effect produced

a) at the ends of the beam by the external forces
b) at the side of the beam by the external forces
c) at the point in the beam by the external forces
d) at all the opposite points by the external forces

**Q15.** Shear stress is

a) indirectly proportional to the Shear Force
b) directly proportional to the Shear Force
c) is always parallel to the Shear Force
d) is not always parallel to the Shear Force

## 4. HISTORY OF ARCHITECTURE

**Q16.** The school that emphasizes simplicity, functionalism and craftsmanship which was founded by Walter Gropius is called

a) The Bauhaze School
b) The Bauhaus School
c) The Ballous School
d) The Bauhell School

**Q17.** A style started in Europe during the thirteenth, to fifteenth centuries, which is characterized by the use of elements such as pointed arches, ribbed vaults, and buttresses is known as

a) Romanesque
b) Roman
c) Rococo
d) Gothic

**Q18.** The Renaissance style originated in

a) Greece
b) Italy
c) France
d) Germany

**Q19.** Ludwig Mies van der Rohe was a leading Architect in

a) post modernism
b) pre-modernism
c) modernism
d) neo-modernism

## 5. BUILDING CONSTRUCTION

**Q20.** Pre-soaking of bricks is required

a) so as to absorb water from the mortar and impair the chemical setting of the cement and sand giving a low mortar strength.
b) so as not to absorb water from the mortar and impair the chemical setting of the cement and sand giving a low mortar strength.
c) so as not to absorb the mortar and impair the chemical setting of the cement and sand giving a low mortar strength.
d) so as not to absorb water from the bricks and impair the chemical setting of the cement and stones giving a low mortar strength.

**Q21.** The post and lintel method of construction is

e) A method of construction in which horizontal post are used to support a horizontal beam.
f) A method of construction in which parallel post are used to support a vertical beam.
g) A method of construction in which lateral posts are used to support a horizontal beam.
h) A method of construction in which vertical posts are used to support a horizontal beam.

**Q22.** In a pile foundation, the size and reinforcement of a beam depend on

a) the load to be discovered and the distance apart of the piles
b) the load of the piles supported
c) the load to be supported and the size of the ground hole
d) the load to be supported and the distance apart of the piles

**Q23.** Buttressing wall is bonded to any other wall and offers

a) maximum support
b) lateral support
c) shear loads
d) tension loads

## 6. BUILDING ENVIRONMENT

**Q24.** In order to incorporate and maximise passive solar design principles in Bhutan, one could

a) design the main living spaces to face east
b) design the main living spaces to face west
c) design the main living spaces to face north
d) design the main living spaces to face south

**Q25.** Passive heating systems can be defined as those where the control of the flow of thermal energy is

a) with the help of stoves that use only natural materials
b) by unnatural means of heating
c) with the use of fixed heating systems in required spaces of the house
d) by natural means

**CIVIL SERVICE COMMON EXAMINATIONS FOR TECHNICAL GRADUATES**
**Paper III: Subject: Architecture**

## 7. TRADITIONAL BHUTANESE ARCHITECTURE

**Q26.** *Dhung* is the traditional Bhutanese architectural term for

a) A type of staircase
b) A window
c) A beam
d) A column

**Q27.** The traditional term for railing is

a) *Thamzi*
b) *Tangzo*
c) *Tazog*
d) *Tazi*

**Q28.** *Thobthang* in traditional Bhutanese architecture

a) is a good system used to ensure nice construction in different architectural elements in a house
b) is a hierarchical system of allowing different design elements in different architecture
c) is a carpentry system of ensuring the correct proportions as per the carpenter's wishes
d) is a design system of ensuring that the owners of houses get the designs they want.

**Q29.** Three different types of *rabsel* found in traditional Bhutanese architecture are

a) *Parop rabsel, Lomang rabsel* and *Drey-zhu rabsel*
b) *Parop rabsel, Drey-zhu rabsel* and *Loshok rabsel*
c) *Gomang rabsel, Lobur rabsel* and *Bouden rabsel*
d) *Parop rabsel, Drey-zhu rabsel*, and *Lobur rabsel*

**Q30.** Timber panels inserted within timber frames in a rabsel are traditionally called

a) *Somzang*
b) *Shoma*
c) *Shaming*
d) *Shamzee*

Roll Number .....

**CIVIL SERVICE COMMON EXAMINATIONS FOR TECHNICAL GRADUATES**
**Paper III: Subject: Architecture**

## SECTION 2: SHORT ANSWER QUESTIONS
**(5 marks for each question. Total marks = 20)**

*Instructions: Answer all questions in this Section.*
*Write the answers in the space provided below each question.*
*Please note that the space provided is not an indication of how long the answer has to be.*

### 8. ARCHITECTURAL DESIGN AND PRACTICE

**Q31.** An Architect's service in a project consists of different stages from start to finish. List and briefly describe the different stages.

**CIVIL SERVICE COMMON EXAMINATIONS FOR TECHNICAL GRADUATES**
**Paper III: Subject: Architecture**

**Q32.** List five traditional Bhutanese architectural elements found in a traditional house. Provide brief descriptions of them. You may include any illustrations or sketches to aid your description.

**CIVIL SERVICE COMMON EXAMINATIONS FOR TECHNICAL GRADUATES**
**Paper III: Subject: Architecture**

**Q33.** Describe briefly why you think Bhutan requires or does not require the incorporation of traditional architectural elements in new architectural designs.

**CIVIL SERVICE COMMON EXAMINATIONS FOR TECHNICAL GRADUATES**
**Paper III: Subject: Architecture**

**Q34.** While designing houses for lower income groups in Bhutan, what design principles do you think should be kept in mind? Describe briefly.

**CIVIL SERVICE COMMON EXAMINATIONS FOR TECHNICAL GRADUATES**
**Paper III: Subject: Architecture**

## SECTION 3 – MAIN CASE-STUDY QUESTIONS
**(50 marks)**

*Instructions:*
*Out of the two questions, select only one and write your answer in the space provided after the two questions. Please note that the space provided is not an indication of how long the answer has to be but please keep in mind that the marks for this question is 50% of the total marks.*

**Q35.** Ms Pema Choki and her husband Mr Tshering Penjore are young Bhutanese business entrepreneurs. They have a 5 year old daughter. The couple would like to construct a home on their plot of land in Paro measuring around 20m x 35m. The plot of land is on a flat site surrounded by pine trees and there are no houses near their site. The site is on top of a mountain and has beautiful views, which overlook the Paro valley towards south. The couple has a decent budget of just around Nu.5 million for the construction and landscaping.

The couple want a home with three bedrooms, two toilets, kitchen, living, dining and a sun deck. The couple are great admirers of green architecture and intend to also include nature within the concept of their daily living. They are flexible about the design and have given you free reign over the design and choice of materials and construction methods. They have requested you to supervise the contract with the building contractor and to supervise the works on their behalf.

Describe how you as an Architect would approach this project (with its different stages of work) with your clients. Explain the different processes you would have to take your clients through to ensure that their dream home is built. Describe why you have arrived at your design concept and why this concept would provide your clients with their dream home. Provide basic schematic design drawings (site layout, plans, elevations and sections- do not forget to indicate the north direction). You may also include any additional illustrations or sketches to explain your design concept.

**Q36.** Bhutan is undergoing rapid urbanisation in many areas. There are many who are worried about the loss of traditional settings that the international community identifies Bhutan with. Using good and bad examples from other countries and within Bhutan, describe your thoughts on how Architects in Bhutan can contribute towards designing good architecture and urban areas in Bhutan. You may use illustrations/drawings to emphasis your points.

**Number of the Question you have selected for this Section .....**