

**ROYAL CIVIL SERVICE COMMISSION  
CIVIL SERVICE COMMON EXAMINATIONS (CSCE) 2008**

**EXAMINATION CATEGORY: TECHNICAL**

**PAPER III: SUBJECT SPECIALIZATION PAPER FOR ARCHITECTURE**

**20<sup>th</sup> December 2008**

**Total Marks** : 100  
**Reading Time** : 15 minutes  
**Examination Time** : 2.5 hours

**READ THE FOLLOWING INSTRUCTION CAREFULLY!**

**I. General Instructions**

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 correction of misprints/ clarifications, if any.
2. Any misprints/ clarifications in the Question Book must be raised in the first 15 minutes.
3. 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.
4. Any pages found missing shall be reported to the invigilators within the first 15 minutes of the receipt of the book.
5. Candidates shall be required to produce the Admission Card while entering the Examination Hall and as and when demanded by authorized officials.
6. Candidates shall not be allowed to carry any papers or other information devices into the Examination Hall.
7. Candidates shall write their allotted Registration Numbers only in the space provided in the Answer Book. No other particulars that would indicate the identity of the candidate shall be written either in the Question or the Answer Book.
8. Candidates shall be allowed to leave the Examination Hall only after the full 2.5 hours time allotted for the examination is completed. If a candidate completes answering the questions, he/she must sit quietly until the allotted time is over.

**II. Specific Instructions**

1. All answers must be written in the separate Answer Book provided. Any answer written in the Question Book shall not be marked.
2. All answers must be written in black or blue ink. Drawings can be done with pencil and colour where applicable.
3. All answers must be written neatly and legibly. Illegible writings shall not be marked.
4. Use of mobile phones shall not be permitted.
5. Normal scale rulers and drafting pencils are permitted.
6. There are **3 Sections of Questions** in this Paper. Read and follow the instructions on how to answer each section carefully!
7. This Question Book consists of 8 printed pages.

## **SECTION 1: MULTIPLE CHOICE QUESTIONS**

(30 marks - One mark for each question)

### ***Instructions:***

***Answer all 30 questions in this section. Copy the question number and the letter of the correct answer onto the Answer Book.***

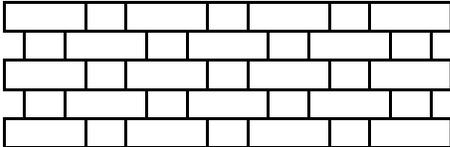
1. In traditional Bhutanese architecture, all of the following are roof features EXCEPT:
  - a) Thogcha
  - b) Gucha
  - c) Jamthog
  - d) Lungo
  
2. One would find a *kadhen* at:
  - a) The base of a *kachhen*.
  - b) The base of a *kachung*.
  - c) The base of a traditional cornice.
  - d) The base of a *rabsel* projection.
  
3. A lean-to roof built at the gable end to protect the structure below from the rain is called:
  - a) Phakhep
  - b) Bokhep
  - c) Pangkhep
  - d) Chenkhep
  
4. A *Lobur Rabsel* is a *rabsel*:
  - a) That covers the entire façade of a building.
  - b) That is broken down into smaller units.
  - c) That is found only in RCC buildings.
  - d) That is found only in lhakhangs.
  
5. Which of the following is NOT true about a *jabzhi*?
  - a) It slopes down on all four sides.
  - b) It may be installed on *jabzhi wogma*.
  - c) It may be installed on all building types.
  - d) Its plan is square in shape.
  
6. The correct order of the following elements from top to bottom is:
  - a) Pedma, Choetseg, Norbu Horzhu and Norbu Bagam
  - b) Choetseg, Pedma, Norbu Horzhu and Norbu Bagam
  - c) Choetseg, Pedma, Norbu Bagam and Norbu Horzhu
  - d) Pedma, Choetseg, Norbu Bagam and Norbu Horzhu

7. In traditional mud blocks, pine leaves were used
- a) To increase the tensile strength.
  - b) To improve the binding quality.
  - c) To promote environment friendly construction.
  - d) To prevent boring by insects.
8. Where is the wattle and daub technique used in traditional Bhutanese architecture?
- a) Roofing
  - b) Flooring
  - c) Walls
  - d) Painting
9. A ziggurat is:
- a) The onion shaped dome of the Islamic architecture.
  - b) The ramparts of the Great Wall of China.
  - c) The stepped pyramids built by the Babylonians.
  - d) The decorative elements in Greek entablature.
10. The ancient Romans transported water from distant places through:
- a) Horse driven carts
  - b) Aquifers
  - c) Aqueducts
  - d) Slaves
11. The building below represents a typical style of architecture that flourished in Europe from about 1000 to 1137 AD. Name the architectural style.
- a) Byzantine
  - b) Romanesque
  - c) Renaissance
  - d) Baroque



12. A column with a large base, fluted shaft and scroll capital would belong to which of the classical orders?
- a) Doric
  - b) Ionic
  - c) Corinthian
  - d) Composite

13. The three pyramids at Giza, Egypt are laid out in which of the following patterns?
- a) Triangular
  - b) Cross
  - c) Circular
  - d) Diagonal
14. A slight convexity in the shaft of a column used to compensate for the illusion of concavity that viewers experience when the sides are perfectly straight is called:
- a) Catharsis
  - b) Entasis
  - c) Synthesis
  - d) Stasis
15. Which of the following architectural element belongs to the Gothic style?
- a) Rose window
  - b) Flying buttress
  - c) Ribbed vault
  - d) All of the above
16. An architectural bracket projecting from a wall and supporting (or appearing to support) a ceiling, beam, or shelf is called:
- a) Corbel
  - b) Corbal
  - c) Corble
  - d) Corbelle
17. The inner surface of an arch is called:
- a) The spandril
  - b) The soffit
  - c) The face
  - d) The haunch
18. Amongst the following architects, post-modern architecture is most associated with:
- a) Le Corbusier
  - b) Michael Graves
  - c) Frank Lloyd Wright
  - d) Ieoh Ming Pei
19. The geodesic dome was invented by:
- a) Norman Foster
  - b) Kenzo Tange
  - c) Alvar Alto
  - d) Buckminster Fuller

20. All of the following are works of Antoni Gaudi EXCEPT:
- Casa Batllo
  - Sagrada Familia
  - Casa Mila
  - Einstein Tower
21. If a brick has only one frog, which side should it face in brickwork?
- To the right
  - To the left
  - Upwards
  - Downwards
22. The figure below is the elevation of an exposed brick wall. Which of the following bond does it show?
- 
- English bond
  - Old English bond
  - Stretcher bond
  - Flemish bond
23. All of the following are true about a *mansard roof* EXCEPT:
- It has two slopes on each of the four sides.
  - It has two slopes on two sides.
  - The lower slope is steeper than the upper slope.
  - It allows usable living quarters to be placed in the attic.
24. In a concrete mix design, the ratio 1:2:4 stands for:
- sand : cement : aggregate
  - cement : sand : water
  - cement : aggregate : water
  - cement : sand : aggregate
25. If the letter M in the M20 concrete refers to the mix, the number 20 refers to:
- The compressive strength of the concrete.
  - The weight of steel required for its reinforcement.
  - The number of days required for curing of the concrete.
  - The life span of the concrete in years.
26. Reinforced Cement Concrete is good in:
- Compression only.
  - Tension only.
  - Tension and compression.
  - Carrying lateral load only.

27. In climatic designs, one would use the solar chart:
- To measure sun's energy
  - To look at the sun safely
  - To calculate the sun's angle
  - For designing the solar cells
28. Double glazing of windows is a good energy saving mechanism because:
- The air gap between the panes absorbs heat from the environment.
  - The air gap between the panes sucks cold air from inside the room.
  - The air gap between the panes does not allow heat transfer.
  - The air gap between the panes produces heat.
29. If the Floor Area Ratio (FAR) on a plot of land of 300 sqm is 1.5 and the permissible plot coverage is 50%, the maximum number of floors permissible would be:
- 2
  - 3
  - 4
  - 5
30. If a wall of 15m long, 5m high and 20cm thick has two openings of 2.5m X 2m each, the number of bricks, measuring 20cm X 10cm X 10cm, required to construct the wall would be:
- 2500
  - 6500
  - 7000
  - 7500

## **SECTION 2: SHORT ANSWER QUESTIONS**

(20 marks - 5 marks for each question)

### ***Instructions:***

***Answer all 4 questions in this section. Copy the question number and write the answers to that question in the separate Answer Book provided.***

#### **Question 31:**

As an architect trained outside Bhutan how would you integrate your acquired professional skills with the indigenous systems, methods and traditions of construction for a successful practice in the country?

#### **Question 32:**

List four salient features of the traditional Bhutanese architecture and describe them briefly. Use illustrations and sketches to aid your description.

**Question 33:**

What is a design brief? Explain its features and significances to an architectural project.

**Question 34:**

In his book *Vers une architecture*, Le Corbusier described '5 points of architecture' that became the guiding principles for many of his designs, most especially Villa Savoye. List and describe each of the 5 points of architecture. Use illustrations where necessary.

**SECTION 3: CASE STUDY QUESTIONS**

(50 marks)

***Instructions:***

***Out of the two questions in this section, select and answer only ONE question. Copy the question number and write the answer in the separate Answer Book provided. Please note that the marks for this question is 50% of the total marks.***

**Question 35:**

*Modern Bhutan is about towns and cities and, watching these small urban jungles coming up, we do not seem to have learnt much. Tradition is largely a façade in most of our so-called modern buildings and our natural construction materials are being ignored. Hotels and apartment blocks are getting bigger than dzongs and lhakhangs.*

*Kuensel Editorial, 10 December 2008*

- a) Increasingly concerns are expressed on the nature and quality of our spaces and built environment, and the transition from the traditional to the modern, as referred to in the quote above. Considering development projects involve many actors and processes, what, in your opinion, are the causes and how can they be addressed? (15 marks)
- b) A number of dzongs, lhakhangs and other historic structures around the country have been 'renovated' and/ or 'restored'. Citing specific examples, explain how these initiatives do or do not help restore these structures to their original intent and glory. (10 marks)
- c) Explain how some of the components and aspects of traditional Bhutanese architecture and the settlement patterns could be incorporated into the contemporary building design/ construction and the built environment either in total or with appropriate adaptations. You may use illustrations/ drawings to emphasize your points. (25 marks)

**Question 36**

Mr. Dorji owns a plot of land in Simtokha which measures 20 m X 25 m. Its shorter sides abut the 4-lane Babesa -Thimphu Expressway on the west and the 6m wide access road on the east. The access road also defines the periphery of the proposed community plaza. The plot has a good view of the Thimphu Chhu to the west of the Expressway and the pine forest across the river.

Mr. Dorji recently learnt that the Municipal Corporation has finalized the plans to develop the proposed community plaza. He has also learnt that the Municipal Corporation has approved a number of development proposals in the area which would attract residents and a large number of visitors, especially the youth. Therefore, he sees this as a good opportunity to capitalize on the development potentials.

He wants to undertake a mixed use development – a cafeteria and a snooker pool room which he is convinced would be very popular with the youth that is expected to gather around and dwelling units of 2-3 bedrooms as the site may permit.

Mr. Dorji has hired you as his architect. Upon checking with the Municipal Corporation and the relevant Development Control Regulations (DCR) for the area in which Mr. Dorji’s plot is located, you find the following development guidelines and restrictions:

<b>DESIGNATED PRECINCT</b>	<b>PLOT AREA</b>	<b>MAX. PLOT COVERAGE</b>	<b>SET BACKS</b>	<b>MAX. HEIGHT</b>
	<b>(Sqm.)</b>	<b>(%)</b>	<b>Front, Side, &amp; Rear</b>	<b>No. of Floors</b>
			<b>Meter</b>	
Urban Village Periphery	371.6 - 1000	40	3 m on three sides and 5 m on the side accommodating the septic tank	2
	1001 - 2500	45		2
	>2500	40		2

<b>USES PERMISSIBLE</b>
Apartments and group housing are permitted. Residential, local level retail shops and services, household economic activity and cottage industries not involving use of, or installation of, a machinery driven by more than 1 KW power and which do not create noise, vibrations, fumes, dust, etc. only in independent dwelling units. Commercial uses like local level retail shops with floor area less than 40m.sqm or internet browsing centre, fast food outlets, canteens, snack bars not exceeding floor area of 30m.sq area will be permitted only on the ground floor per plot. Bars, discotheque, pool rooms and any other night time recreational centers and activities contradicting with residential uses would not be permitted.

Describe how you would approach this project and the different processes you would have to take your client through to ensure that the project both meets the client’s objectives and achieves development permission from the Municipal Corporation. Propose a design concept and describe why you have arrived at it. Provide basic schematic design drawings (site layouts, plans, elevations and sections – do not forget to indicate the north direction). (50 marks)

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