

**ROYAL CIVIL SERVICE COMMISSION
BHUTAN CIVIL SERVICE EXAMINATION (BCSE) 2010
EXAMINATION CATEGORY: TECHNICAL**

PAPER III: SUBJECT SPECIALIZATION PAPER for ARCHITECTURE

Date	: 24 November 2010
Total Marks	: 100
Examination time	: 2.5 Hours
Reading Time	: 15 Minutes

INSTRUCTIONS

1. Do not write anything during the first 15 minutes. This time is provided to check the number of pages of this Question Booklet, to check for printing errors, to read the instructions, and to clarify doubts.
2. Write your Roll Number clearly on the Answer Booklet in the space provided.
3. Write all answers either in **Blue** or **Black** ink only. For drawings use pencil and colour, where applicable.
4. Write all answers in the Answer Booklet provided. You are not allowed to write anything in the Question Booklet. Note that any answer written in the Question Booklet shall not be marked.
5. Write answers neatly and legibly. Illegible writing shall not be marked.
6. This Question Booklet consists of **8** pages. The questions are divided into **TWO** sections, **SECTION A** and **SECTION B**.
7. **SECTION A** consists of **TWO** parts, **PART I** and **PART II**.

PART I consists of 30 multiple choice questions and each question carries one (1) mark. Answer all 30 questions.

PART II consists of 4 short answer questions of five (5) marks each. Answer all 4 questions.

8. **SECTION B** consists of 2 **Case Study** questions of fifty (50) marks each. Choose and answer only **ONE** question from this section.
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SECTION A - PART I: MULTIPLE CHOICE QUESTIONS

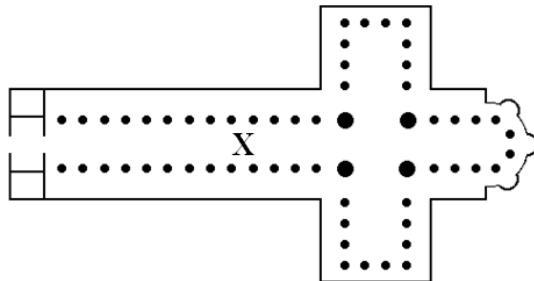
(30 marks – One mark for each question)

Instructions: Answer all 30 questions in this section. Copy the question number and the letter of the answer of your choice onto the Answer Booklet.

1. A public square in a Roman city flanked by the principal religious and official buildings is called
 - a) Agora
 - b) Adytum
 - c) Forum
 - d) Corona
2. A continuous colonnade around a temple is known as
 - a) Peristyle
 - b) Prostyle
 - c) Peripteral
 - d) Pulvinus
3. A high wall with a band of narrow windows along the very top which usually rises above adjoining roofs is called
 - a) Dormer
 - b) Clerestory
 - c) Aisles
 - d) Oculus
4. The sides of doors and windows are known as
 - a) Sills
 - b) Jambs
 - c) Lintels
 - d) Stiles
5. Rusticated masonry blocks placed to give emphasis to the corner of a building is known as
 - a) Headers
 - b) Stretchers
 - c) Closers
 - d) Quoins

6. In the sketch below of a typical church plan, the area marked by the letter X is referred to as

- a) Apse
- b) Nave
- c) Aisles
- d) Transept



7. U-value of a material is a measure of its

- a) Thermal resistance
- b) Thermal conductivity
- c) Thermal resistivity
- d) Thermal transmittance

8. All of the following defects in timber are due to seasoning EXCEPT

- a) Warp
- b) Bow
- c) Burls
- d) Cup

9. The strength of brickwork mainly depends on

- a) Type of mortar used
- b) Individual strength of the brick
- c) Quality of water used
- d) Type of cement used

10. Small pieces of stones, glass, etc (generally of different colours) laid in cement mortar to form artistic patterns for flooring, dados, etc is called

- a) Mat-finish
- b) Mastic
- c) Mosaic
- d) Parquet

11. Which of the following is NOT TRUE about seasoning of timber?

- a) Removes all the moisture from the timber
- b) A certain amount of moisture is allowed to remain
- c) Increases the durability of timber
- d) Increases the strength of timber

12. In a stone wall, individual stones should be placed with

- a) Natural beds horizontal
- b) Natural beds vertical
- c) Natural beds radial
- d) Natural beds always perpendicular to that of the previous course

13. A concrete of M15 grade would generally be recommended for

- a) Water retaining structures
- b) Heavily loaded RCC columns
- c) RCC works in buildings
- d) RCC arches of long span

14. In concrete mixes, slump test is used to assess

- a) Workability of concrete
- b) Variations in the uniformity of a mix
- c) Proportions of a dry mix
- d) Strength of concrete

15. In masonry walls the terms ‘butt’, ‘rebated’ and ‘cramped’ refers to kinds of

- a) Joints
- b) Dressing
- c) Courses
- d) Copings

16. Which of the following did the Vitruvian proportion of classical orders use as a unit of measurement?

- a) Height of a column
- b) Diameter at the top of a column
- c) Diameter at the base of a column
- d) Semi-diameter of a column

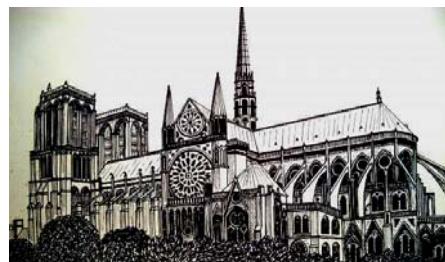
17. Which famous architect developed the Modulor, a system of measurement based on the Golden Section and Fibonacci numbers, tailored to the average human body?

- a) Le Corbusier
- b) Frank Lloyd Wright
- c) I M Pei
- d) Oscar Niemeyer

18. Which famous architect believed that there was a realm of the divine within nature and all architecture was ‘a sermon in stone’?

- a) Le Corbusier
- b) Frank Lloyd Wright
- c) Louis Sullivan
- d) Alvar Aalto

19. The sketch below shows one of well-known churches. Name it.



- a) Westminster Abbey, London
- b) St Paul's Cathedral, London
- c) St. Peter's Basilica, Rome
- d) Notre Dame Cathedral, Paris

20. The generally accepted sequence in the evolution of the classical orders is

- a) Ionic, Doric, Corinthian
- b) Doric, Corinthian, Ionic
- c) Doric, Ionic, Corinthian
- d) Ionic, Corinthian, Doric

21. In perspective drawing, the further the picture plane is from the Observer, the drawing will be

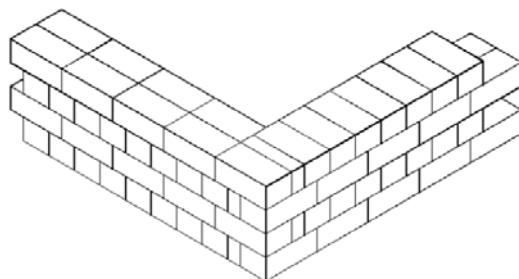
- a) Smaller
- b) Larger
- c) Same
- d) All of the above

22. In designing for cross ventilation, for a given elevational area and a given total wind force, the largest air velocity will be obtained

- a) Through a large inlet opening with a small outlet
- b) Through a small inlet opening with a large outlet
- c) By maintaining same area for both the openings
- d) By having only one opening

23. Name the type of masonry shown in the sketch of brick work below.

- a) Header Bond
- b) Stretcher Bond
- c) Flemish Bond
- d) English Bond



24. For the maximum use of passive solar energy, the best orientation for buildings in Bhutan is facing

- a) East
- b) South
- c) West
- d) North

25. When designing and planning on slopes, it is best to place building/ street

- a) Along the contour
- b) Across the contour
- c) Diagonal to the contour
- d) On a leveled ground

26. Rabsel on the Bhutanese houses are one of the most characteristic features of traditional architecture. Name the rabsel shown below.



- a) Boedgo Rabsel
- b) Gyesargo Rabsel
- c) Lobur Rabsel
- d) Gomang Rabsel

27. The correct order of following elements of Bhutanese architecture from top to bottom is

- a) Choetsi – Dhung – Pem – Bagam
- b) Dhung – Bagam – Pem – Choetsi
- c) Choetsi – Pem – Bagam – Dhung
- d) Pem – Choetsi – Bagam - Dhung

28. All of the following are found in the roof structure EXCEPT

- a) Gung-chhung
- b) Sha-thung
- c) Lhiu-chung
- d) Zim-chung

29. In Bhutansese architecture, a house constructed with rammed earth is called

- a) Shing khim
- b) Tsig khim
- c) Jang khim
- d) Dring khim

30. In traditional Bhutanese architecture, **zowo lopen** refers to

- a) The master carpenter
- b) The teacher from whom a carpenter learned his trade
- c) The spiritual master of a carpenter
- d) An important carpentry tool

SECTION A – PART II: SHORT ANSWER QUESTIONS

(20 marks – Five marks for each question)

Instructions: Answer all 4 questions in this section. Copy the question number and write the answers to the question in the Answer Booklet.

Question 31:

List three ‘sustainable’ concepts found in a traditional Bhutanese house and describe them briefly. You may use illustrations and sketches to aid your description.

Question 32:

The great French architect Le Corbusier famously stated that ‘the building is a machine for living in’. Do you agree with the statement? Give reasons for your views.

Question 33:

In Bhutanese architecture there is a term called ‘**thobthang**’ that determines the entitlement of various architectural elements. How relevant is such a system to the present context? Use examples to illustrate your answer.

Question 34:

In your opinion which design factors should have the most influence on the building form? You may use drawings or sketches to illustrate your answer.

SECTION B: CASE STUDY QUESTIONS

(50 marks)

Instructions: Select and answer only ONE question in this section. Copy the question number and write the answer in the Answer Booklet. Note that the mark for this question is 50% of the total marks.

Question 35:

Architecture is often stated to be an outward expression of inwardly held beliefs. Giving specific examples state how such ‘expressions’ are observed in Bhutanese architecture and settlement patterns and explain how the essential features of these ‘expressions’ could be used in the context of modern buildings and urban settlements in Bhutan. Use as many illustrations and sketches as necessary to support and clarify your statements.

Question 36:

Ms Choki and her husband Mr. Penjore are middle aged Bhutanese couple with a 23 year old daughter who still lives with them. They recently moved to Trashiyangtse, their hometown, after Mr. Penjore resigned from his job in Thimphu to work on his own as a freelance research consultant. Ms Choki is an expert in traditional textiles and she also weaves for hobby. In Trashiyangtse the couple owns a plot of land measuring 40m X 50m just outside Trashiyangtse town. The plot is on a gentle slope on top of a small hill and has a beautiful view of the town to its east and the famous Chorten Kora (stupa) and the Kholung Chu (river) to its south. There is already an access road to the plot at its lower end.

The couple wants to build a house with three bedrooms, two toilets, a kitchen, a living room, a dining room and a study which Mr. Penjore intends to use as his office as well. They have learnt that Trashiyangtse is being promoted as a tourist town and a large number of tourists are expected to visit the town. Ms Choki sees these as an opportunity to make a business out of her weaving hobby. Therefore, the couple wants to include a textile showroom with a weaving area within the house for tourists. They are flexible about the design but have informed you of the special conditions set for construction of buildings in and around the town. Only locally available stone and timber are to be used at least for the building exterior and the maximum number of floors permitted is two. They have also asked you to include any other facilities like parking areas and toilets that may be necessary to cater to the tourists.

Describe how you as an architect would approach the project and the different processes you would have to take your client through to ensure that the project meets both the clients' objectives and the overall development policies set for Trashiyangtse town. Propose a design concept and describe why you have arrived at it. Provide basic schematic design drawings (site layout, plans, elevations, and sections). Do not forget to indicate the north direction.

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