**ROYAL CIVIL SERVICE COMMISSION**

**BHUTAN CIVIL SERVICE EXAMINATION (BCSE) 2014**

**EXAMINATION CATEGORY: TECHNICAL**

**PAPER III: SUBJECT SPECIALIZATION PAPER for *ARCHITECTURE***

**Date** : 12 October 2014

**Total Marks** : 100

**Examination Time** : 150 minutes (2.5 hours)

**Reading Time** : 15 Minutes (prior to examination time)

**GENERAL INSTRUCTIONS:**

1. Write your Roll Number clearly and correctly on the Answer Booklet.
2. The first 15 minutes is being provided to check the number of pages of Question Paper, printing errors, clarify doubts and to read the instructions. You are NOT permitted to write during this time.
3. This paper consists of **TWO SECTIONS**, namely SECTION A and SECTION B:

* **SECTION A** has two parts: Part I - 30 Multiple-Choice Questions

Part II - 4 Short Answer Questions

All questions under SECTION A are COMPULSORY.

* **SECTION B** consists of two Case Studies. Choose only ONE case study and answer the questions under your choice.

1. All answers should be written with correct numbering of Section, Part and Question Number in the Answer Booklet provided to you. Note that any answer written without indicating any or correct Section, Part and Question Number will NOT be evaluated and no marks would be awarded.
2. Begin each Section and Part in a fresh page of the Answer Booklet.
3. You are not permitted to tear off any sheet(s) of the Answer Booklet as well as the Question Paper.
4. Use of any other paper including paper for rough work is not permitted.
5. You are required to hand over the Answer Booklet to the Invigilator before leaving the examination hall.
6. This paper has **08** printed pages in all, excluding this instruction page.

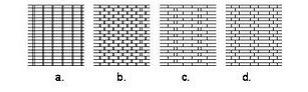
**GOOD LUCK!**

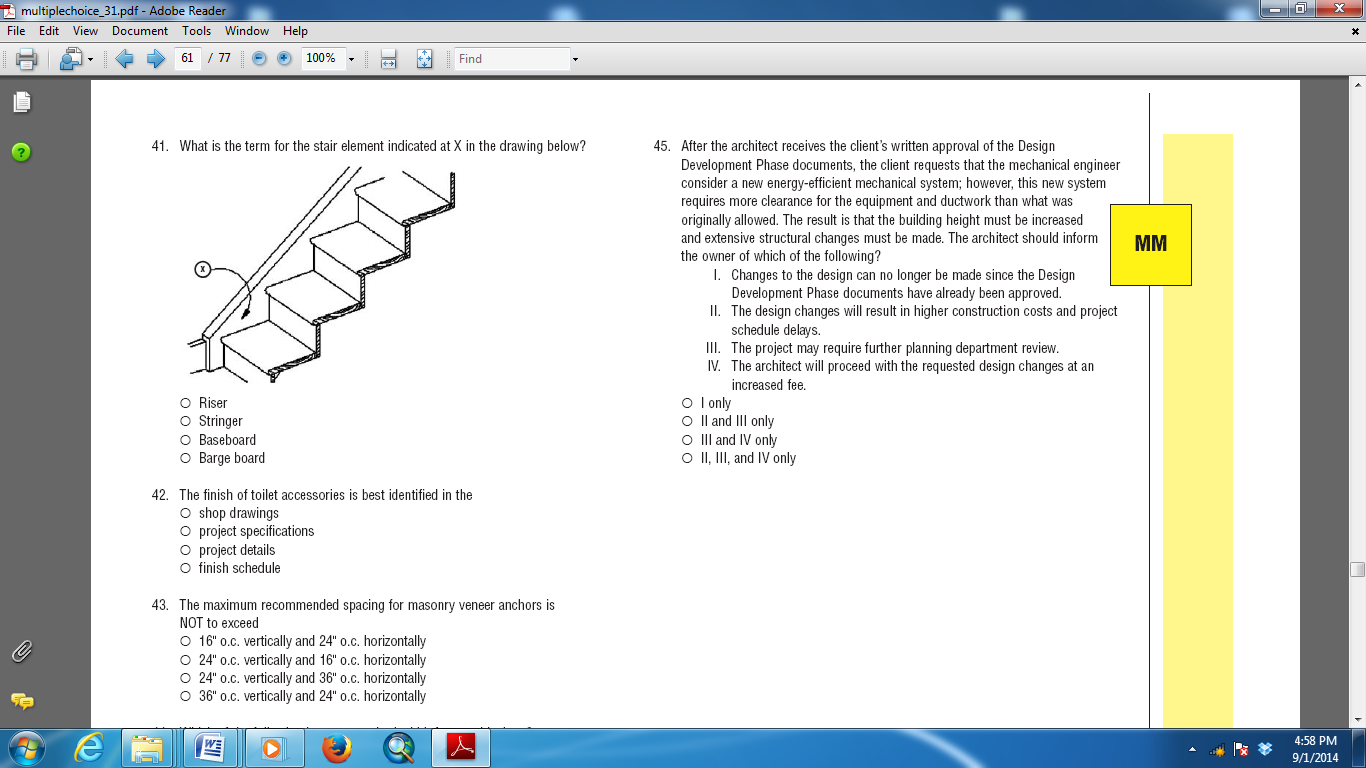
**SECTION A  
PART I - Multiple Choice Questions (30 Marks)**

**Choose the correct answer and write down the letter of the correct answer chosen in the Answer Booklet against the question number. E.g. 31 (c). Each question carries ONE mark. Any double writing, smudgy answers or writing more than one choice shall not be evaluated.**

1. Greek architecture was essentially.
2. Helm Roof
3. Domical roof construction
4. Columnar trabeated
5. Arch and vault
6. Which historic style of architecture first introduced the clerestory?
7. West Asiatic
8. Roman
9. Greek
10. Egyptian
11. Buddhist architecture shown in rock-cut temples with lavishly carved interiors is a characteristic feature of what style of architecture?
12. Roman
13. Chinese
14. Japanese
15. Indian
16. Triangular piece of wall above the entablature.
17. Pediment
18. Pendentive
19. Architrave
20. Frieze
21. From the Greek temples, a temple that have porticoes of columns at the front and rear.
22. Amphi-Prostyle
23. Astylar
24. Dipteral
25. Tympanum
26. "Form follows function".
27. Le Corbusier
28. Buckminster Fuller
29. Louis Sullivan
30. Marcel Lajos Breuer
31. Mies van der Rohe first envisioned the all-glass skyscraper in the 1920s.A true genius, he designed a structure that could not be built at that time, but some thirty years later the technology was at hand. The long-held dream of the crystalline tower was finally realized in these famous building, 38 stories of black steel and glass.
32. Lakeshore Drive Apartment
33. S.R. Crown Hall
34. Seagram Building
35. Lever House
36. "cubicula" or bedroom is from what architecture.
37. Byzantine
38. Roman
39. Greek
40. Egyptian
41. What do you call the tool in architecture which organizes space or spatial composition related to function?
42. Space planning
43. Functional interrelationship diagram
44. Territoriality
45. Space articulation
46. "Architecture is Organic".
47. Frank Lloyd Wright
48. Mies van de Rohe
49. Le Corbusier
50. Walter Gropius
51. "A house is a machine to live in".
52. Mies van de Rohe
53. Le Corbusier
54. Walter Gropius
55. Frank Loyd Wright
56. Which construction system permit great spans of infinite variety of shapes of concrete, or steel combined with glass or plastic?
57. Thin shell construction
58. Frame construction
59. Space frame
60. Suspension system

1. What art principle shows the relationships between the various parts of an object/ structure/groups of objects and structures?
2. Scale
3. Proportion
4. Size
5. Volume
6. What is referred to as written record of man’s effort to build beautifully?
7. History of architecture
8. Pre-historic architecture
9. Elements of architecture
10. Style of architecture
11. Parts of an entablature, in order of top to bottom. i. Cornice    ii. Frieze      iii. Architrave
12. iii, i, ii
13. i, ii, iii
14. i, iii, ii
15. ii, i, iii
16. The correct order of the following elements from top to bottom is:
17. Choetseg, Pedma, Norbu Bagam and Dung.
18. Pedma, Choetseg, Norbu Bagam and Dung
19. Norbu Bagam, Pedma, Choetseg and Dung
20. Dung, Choetseg, Pedma and Norbu Bagam
21. What historic style of architecture contributed the Doric, Ionic, and Corinthian “Orders of Architecture?
22. Greek
23. Egyptian
24. Early Christian
25. Byzantine
26. Which of the following indicates the name of a color?
27. Value
28. Chroma
29. Hue
30. Intensity
31. The mineral of greatest importance to Greek architecture of which Greece and her domains had ample supply of was.
32. Lime
33. Cement
34. Silica
35. Marble
36. With the use of concrete made possible by pozzolan, a native natural cement, the Romans achieved huge interiors with the...
37. Helm Roof
38. Arch and vault
39. Domical roof construction
40. Columnar trabeated
41. Mediaeval architecture, which is characterized by the pointed style, was prevalent in Western Europe from the 13th to the 15th century. What do you call this style?
42. Doric
43. Gothic
44. Arabesque
45. Romanesque
46. A roman house with a central patio.
47. Atrium House
48. Domus
49. Thalamus
50. Villa
51. The stressing of unbounded tendons after concrete has cured is
52. Pre-tensioning
53. Pre-casting
54. Lift slab
55. Post-tensioning
56. The ratio of concrete design mix of M15 is
57. 1:1:2
58. 1:1.5:3
59. 1:3:6
60. 1:2:4
61. The part of a foundation system which supports the exterior walls of a superstructure and bears directly on the column footing is a
62. Foundation course
63. Grade wall
64. Foundation wall
65. Grade beam
66. Joint employed to reduce restraint by accommodating movement of masonry walls are known as
67. Cold joints
68. Control joints
69. Block outs
70. Expansion joints
71. In the design of a large shopping centers where space is required, intervals of columns can be wider than the ordinary by adopting a structural method of construction called
72. Compressioning
73. Post-tensioning
74. Pre-casting
75. Pre-tensioning
76. A principal member of the truss which extends from one end to the other primarily to resist bending is a
77. Web member
78. Girt
79. Chord
80. King post
81. Identify which figure is flemish (double stretcher) brickwork



1. a
2. b
3. c
4. d
5. What is the term for stair element indicated at X in the drawing shown here; 
6. Riser
7. Stringer
8. Baseboard
9. Tread

**PART – II : Short Answer Questions (20 marks) Answer ALL the questions. Each question carries 5 marks.**

**Question 1**

What are the five objectives of the Bhutan Building Rules - 2002 (BBR-2002) that came into force with effect from 1st January 2003?

**Question 2**

List five traditional Bhutanese architectural elements found only in Dzongs and monasteries. Describe them briefly and provide sketches to aid your descriptions.

**Question 3**

In the last five years of your study, whose work has had the greatest influence in your designs? You may use drawings or sketches to emphasize your answer.

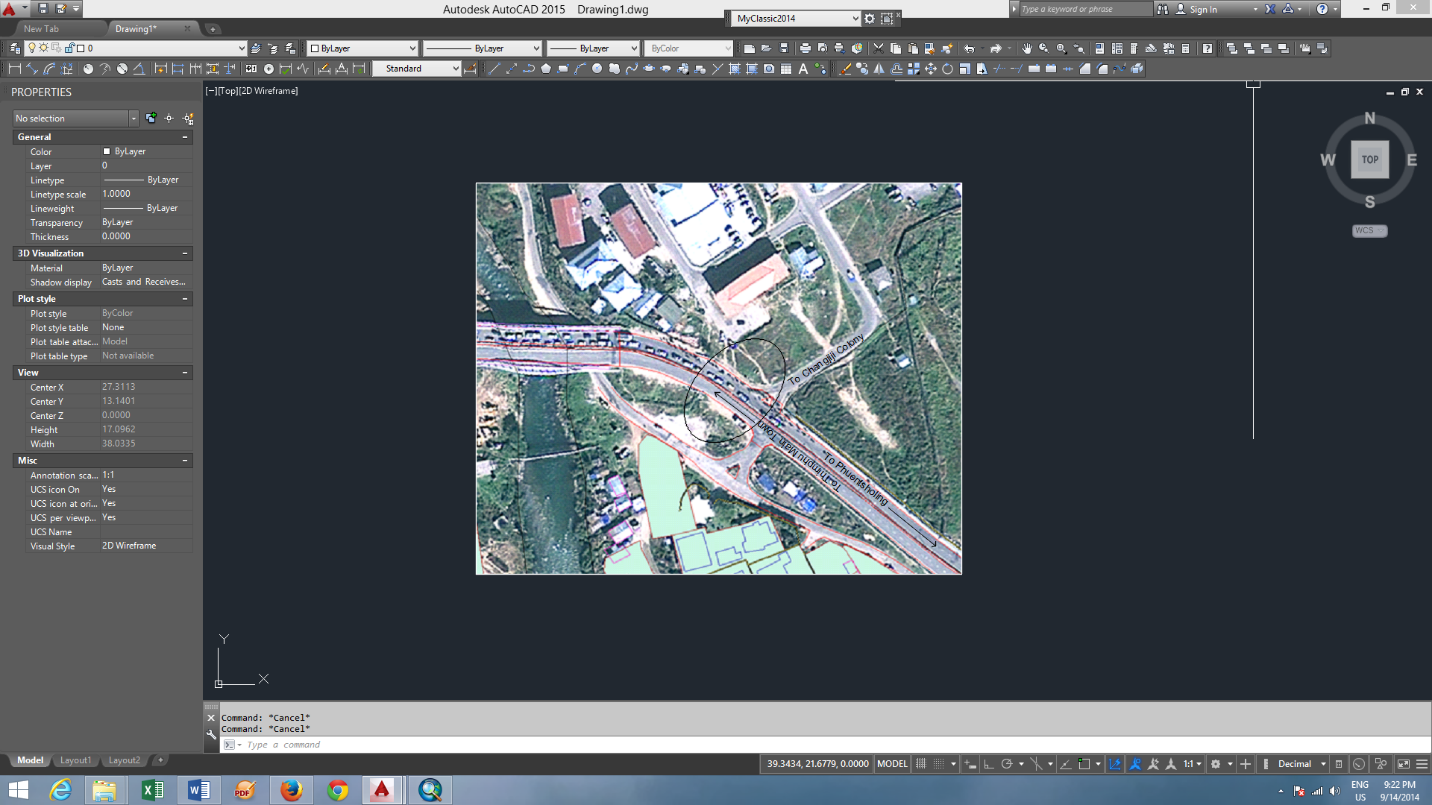
**Question 4**

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

**SECTION B: Case Study**

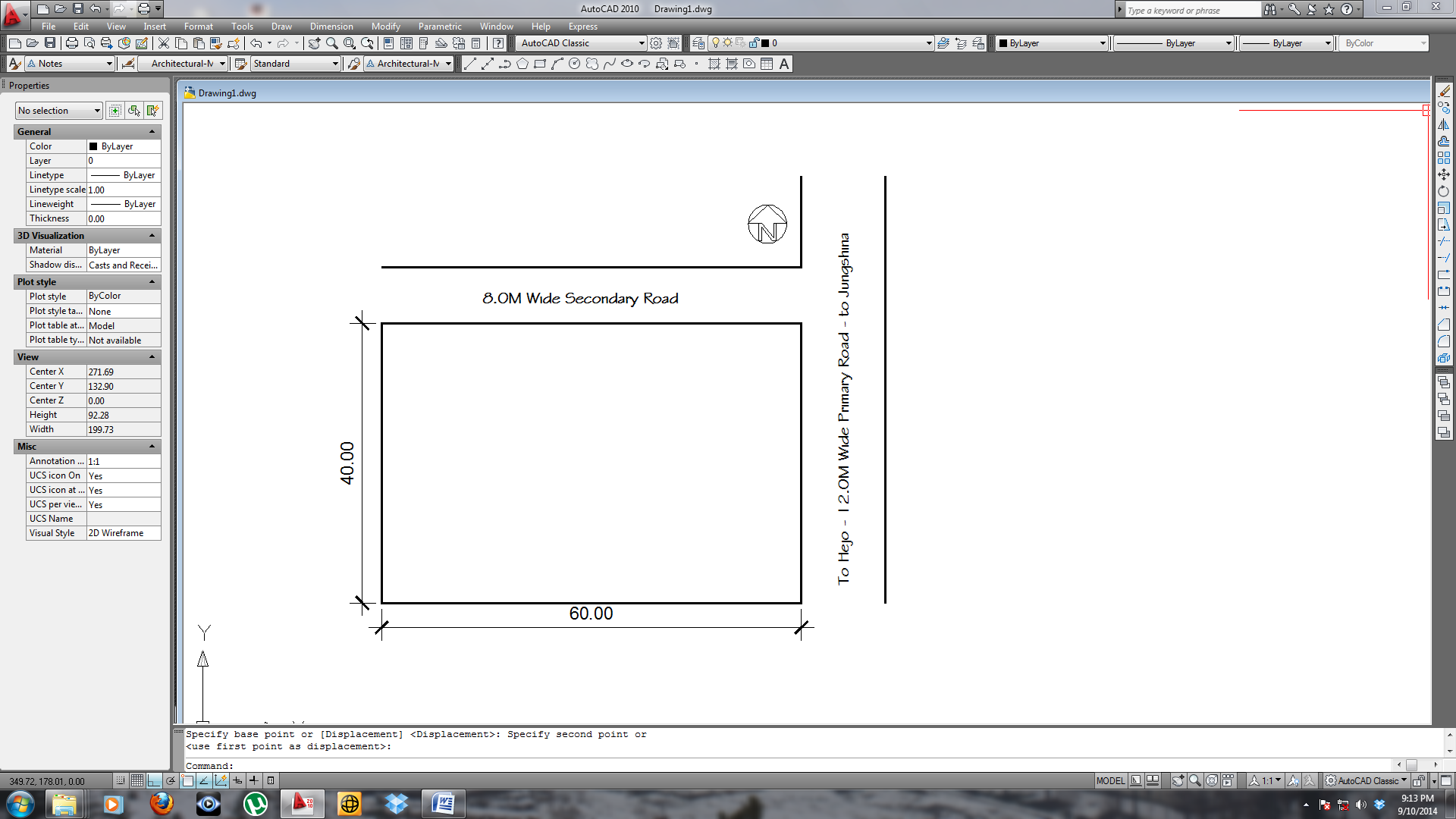
**Choose either Case 1 or Case 2 from this Section. Each Case carries 50 marks. Mark for each question is indicated in the brackets.**

**CASE 1**

Of late, the government has recognized the need of (pedestrian) footbridge over the existing 18.0M Right Way Expressway near the road entrance to Changjiji Colony and decided to invite project proposal from the Architectural Firms across the country. One of the participating firms has invited you to come out with the proposal.

The proposal should incorporate traditional architectural features and should also blend with the surrounding landscape. Moreover, the conceptual design shall be based on a more human scale. The location should be within the ellipse in the photo. Describe how you would approach this project. Propose a design concept and describe why you have arrived at it. Also specify the materials used and the reason for doing so. Provide basic schematic design drawings (site layouts, plans, elevations, sections, 3D sketches/isometric views) (50 marks)

**CASE 2**

Mr.Wangchuk is a contractor who lives with his wife and two children in Thimphu. Due to nature of his work, he is most of the time out of Thimphu. His wife runs a small cloth shop in Changzamtog whereas his two children studies in Motithang Higher Secondary School. After working as a Contractor for almost ten years and with the savings, they bought a plot of land measuring 60m x 40m in Hejo, Thimphu.

The plot is located on a flat area and abuts the main Hejo-Jungshina Road. It is opposite to Indian Embassy and a secondary road also passes along one side of the plot. The plot falls under the UV-1 Precinct.

The couple has decided to build a strip-mall on this plot and they have hired you as a consultant architect. Although they are quite flexible about the spatial requirements, they have expressed the need for incorporation of green building designs and the traditional Bhutanese Architectural features.

Upon checking with the Thimphu Municipality and the relevant Development Control Regulations (DCR) for the area in which Mr. Wangchuk’s plot is located, you find the following development guidelines and restrictions:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Designated Precinct** | **Plot Area** | **Max. Plot Coverage** | **Set Backs**  **Front, Side & Rear** | **Max. Height** |
|  | **(SQ.M)** | **(%)** | **Meter** | **No. of Floors** |
| UV-1  Urban Village Core | 1000-2500 | 50 | 2 m in the Front, 3 m in the side, & 5 m at the rear. | 2 |
| 2501-5000 | 45 | 2 |
| >5000 | 40 | 2 |

Please note that any access to this plot is only permissible from the 8.0M wide secondary road.

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 Authority. Propose a design concept and describe why you have arrived at it. Also specify the main building materials used and the reason for doing so. Provide basic schematic design drawings (site layouts with setbacks, floor plans, elevations, sections, plot coverage, total floor area – do not forget to indicate the north direction). (50 marks)