

Full Marks: 210

Time: 03 Hours

- N.B
- Answer any three questions from each section in separate script
  - Figures in the right margin indicate full marks
  - Necessary graphs: Normal graph for question 2 (b)



Section-A

- Define the following terms: i) Allowable stress, ii) Tangential stress, iii) Normal stress 06
  - A bronze rod is rigidly attached between a steel rod and an aluminum rod shown in **[fig. 1(b)]**. Axial loads are applied at different positions indicated. Calculate the maximum load 'F' that must not exceed the stress in steel of 150MPa, in aluminum of 100MPa and in bronze of 120MPa. Draw the axial force diagram (AFD) also. 14

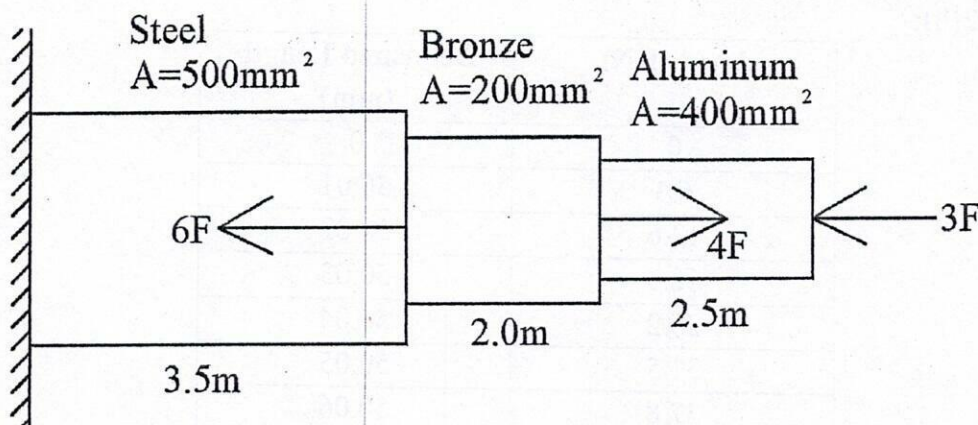


Fig. 1(b)

- Find out the tensile or compressive stresses in the members BC, BD and CE for the truss shown in **[fig. 1(c)]**. The cross-sectional area for each member is 1500mm<sup>2</sup>. 15

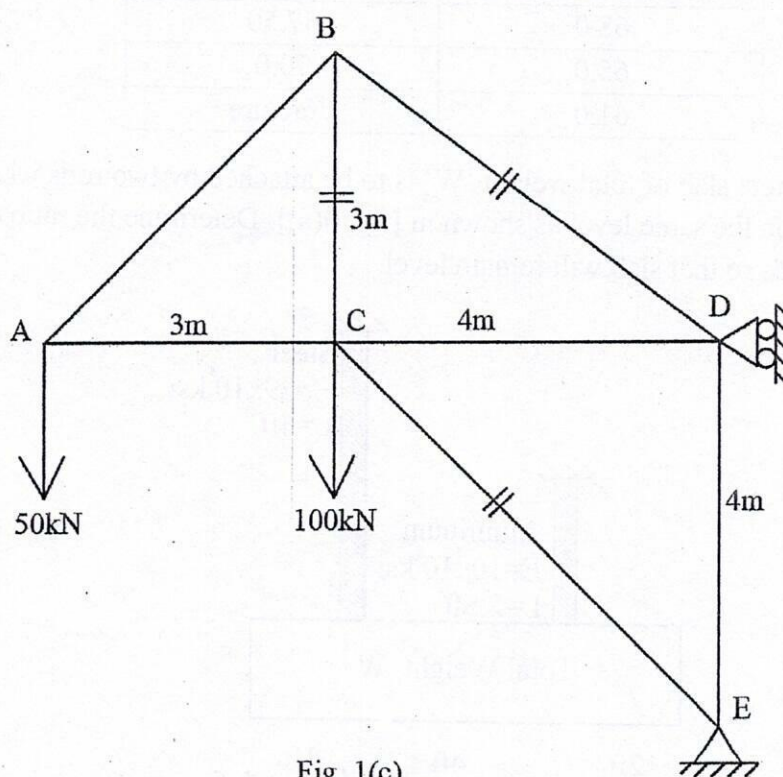


Fig. 1(c)

2. a) Calculate the average shear stress on the 20mm at A and B for the given loads shown in [fig. 2(a)]. 12

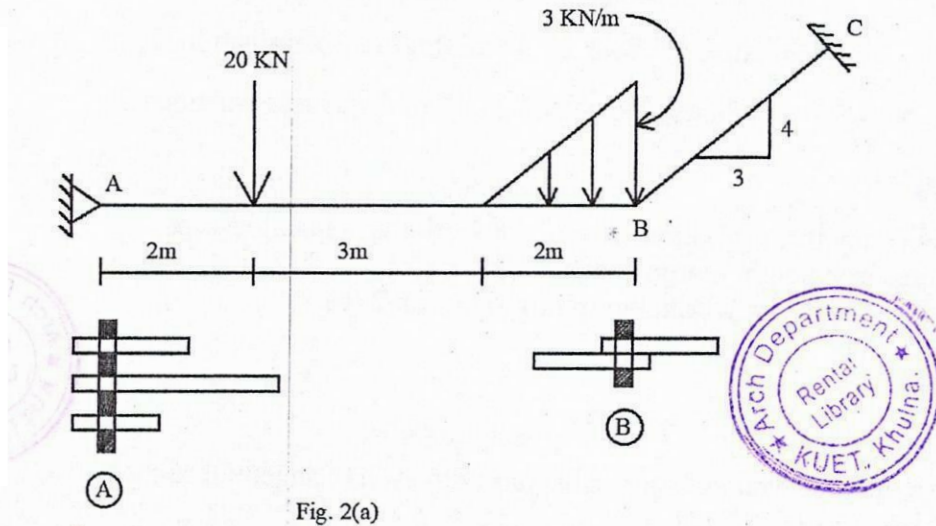


Fig. 2(a)

- b) The following data shown in [Table 2(b)] were recorded during the tensile test of 12mm diameter mild steel rod in SM lab of KUET. The gauge length was 50mm. Plot the stress-strain diagram and determine the following properties: i) Proportional limit, ii) Modulus of elasticity, iii) Yield strength, iv) Ultimate strength, v) Rupture strength [Normal graph paper should be provided]

Table 2(b):

Load (kN)	Deformed Length (mm)
0	0
6.3	50.01
12.6	50.02
18.9	50.03
25.2	50.04
31.5	50.05
37.8	50.06
40.0	50.163
41.6	50.433
46.2	51.25
52.4	52.50
68.0	57.50
65.0	70.0
61.0	Fracture

3. a) A uniform concrete slab of total weight 'W' is to be attached by two rods whose lower ends are on the same level as shown in [fig. 3(a)]. Determine the ratio of the areas of the rods so that slab will remain level. 16

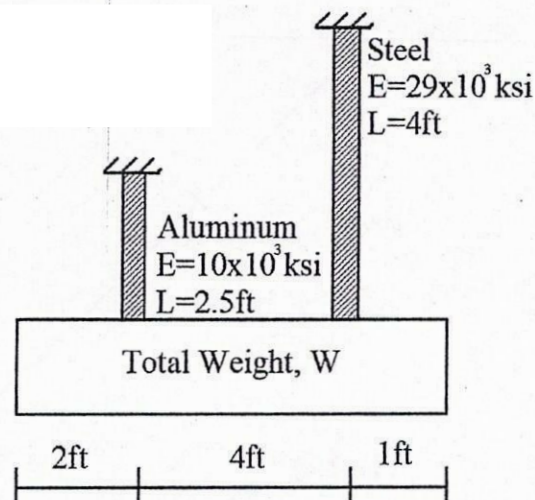


Fig. 3(a)

- b) Write short notes on Flexural rigidity, Tearing stress; Section modulus. 06
- c) State and describe moment-area theorem that is used to determine the tangential deviation. 13

4. A steel beam is loaded as shown in [fig. 4]. Calculate the slope at A and E and deflection at B and D. Given,  $E=29000\text{Ksi}$  and  $I=341\text{in}^4$  35

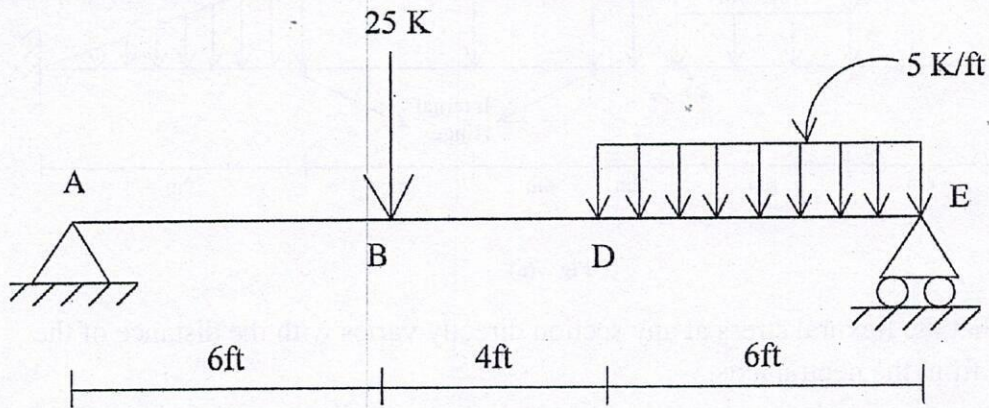


Fig. 4



Section-B

5. a) What is pure bending? Show the relation between load, shear & moment. 15
- b) A cast iron beam of 12m long & supported as shown in the [Fig. 5(b)] carries a UDL of  $W$ , N/m (including its own weight). At two corners it also carries two point load of " $W$  (N)". For the section shown in the figure, determine the maximum safe value for  $W$ , where allowable stress one  $\sigma_t \leq 60\text{MPa}$  &  $\sigma_c \leq 90\text{MPa}$ . 20

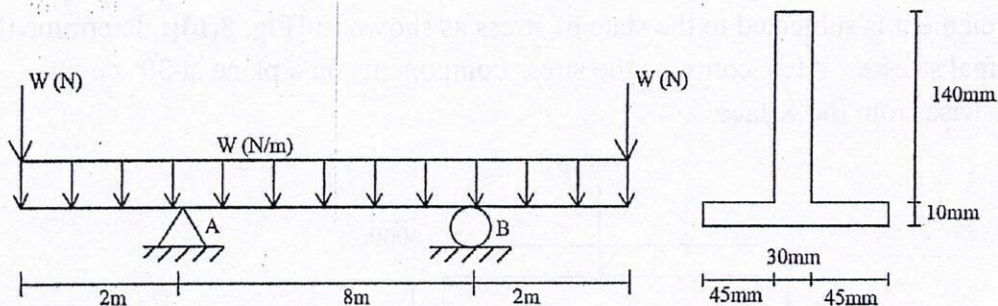


Fig. 5(b)

6. a) Derive the formula for horizontal shearing stress  $\tau = VQ/Ib$ , where the symbols bear their usual meaning. 15
- b) Determine the minimum width of ' $b$ ' of the beam shown in [Fig. 6(b)] if the maximum shearing stress must not exceed 1000psi. 20

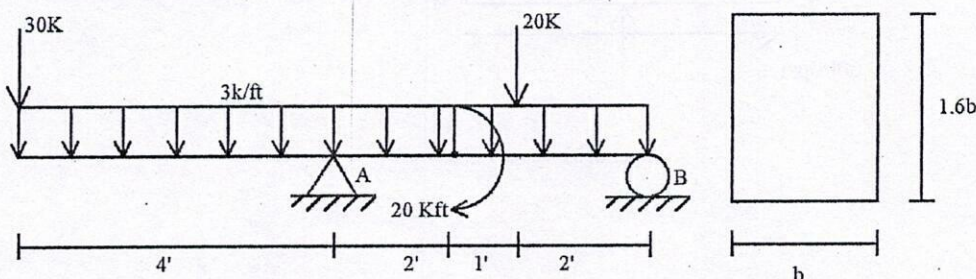


Fig. 6(b)

7. a) Draw the Shear Force Diagram & Bending Moment Diagram for the following loaded beam. [Fig. 7(a)]

25

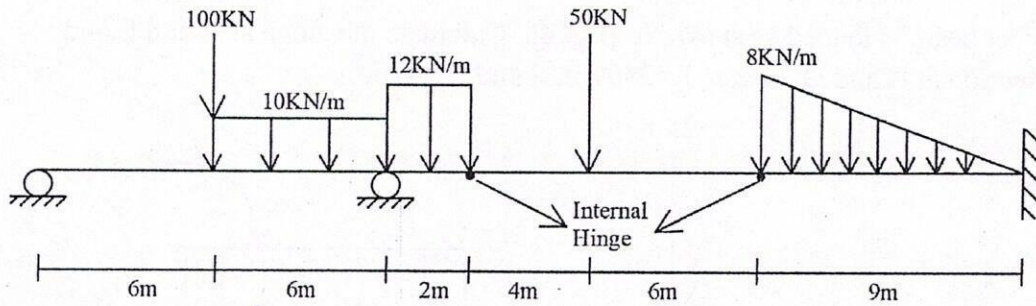


Fig. 7(a)

- b) Show that the flexural stress at any section directly varies with the distance of the section from the neutral axis.

10

8. a) Draw the Shear Force & Bending Moment Diagram of the following figure. [Fig. 8(a)]

15

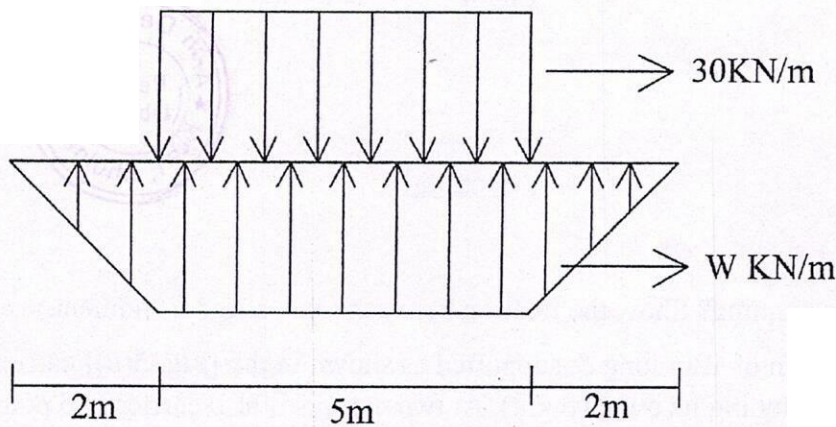


Fig. 8(a)

- b) If an element is subjected to the state of stress as shown in [Fig. 8(b)]; determine the principal stresses. Also, compute the stress components on a plane at  $30^\circ$  counter clock-wise from the X face.

20

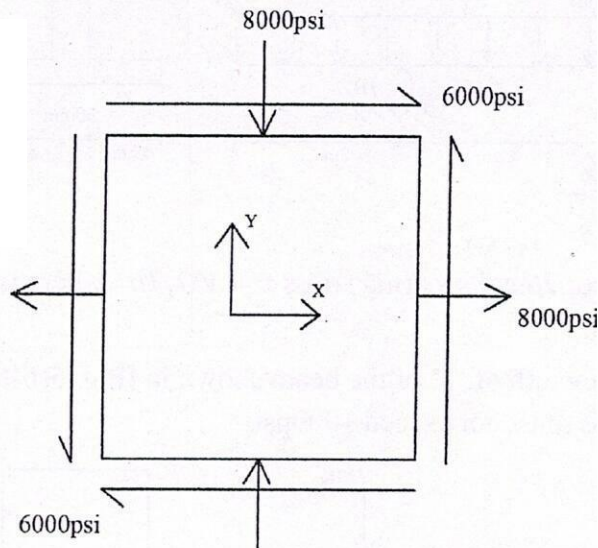


Fig. 8(b)

Khulna University of Engineering & Technology

Department of Architecture

B. Arch 2<sup>nd</sup> Year 2<sup>nd</sup> Term Regular Examination, 2022

Course No: Hum 2225 Course Title: Philosophy

Full Marks: 210

Time: 03 Hours

- N.B i) Answer any three questions from each section in separate script  
ii) Figures in the right margin indicate full marks

Section-A

- |    |   |    |
|----|---|----|
| 1. | a) What is philosophy?  | 10 |
|    | b) Discuss the dialectical method of philosophy.  | 10 |
|    | c) Discuss the nature of philosophy.  | 15 |
| 2. | a) What is knowledge?   | 10 |
|    | b) Describe the method of criticism.  | 10 |
|    | c) "Man is the measure of all thing"- Explain the statement of Protagoras.                                | 15 |
| 3. | a) What is empiricism?  | 10 |
|    | b) Discuss empiricism as a theory of the knowledge. Is it satisfactory theory of the origin of knowledge? | 10 |
|    | c) Explain critically David Hume's theory of knowledge.   | 15 |
| 4. | a) What is rationalism?   | 10 |
|    | b) Discuss rationalism as a theory of the origin of knowledge.  | 10 |
|    | c) Explain and evaluate Authoritarianism as a theory of the origin of knowledge.                          | 15 |



Section-B

- |    |   |    |
|----|---|----|
| 5. | a) What is evolution?   | 10 |
|    | b) Discuss about the characteristics of evolution.                              | 10 |
|    | c) Explain and evaluate Henry Bergson's creative evolution.                     | 15 |
| 6. | a) What are the characteristics of Indian philosophy?                           | 10 |
|    | b) Explain the importance of 'Confucianism' in Chinese society.                 | 10 |
|    | c) How is Chinese philosophy different from Indian philosophy?                  | 15 |
| 7. | a) What is phenomenism?   | 10 |
|    | b) What are the differences between phenomenism and existentialism?             | 15 |
|    | c) What were the main concerns of Frankfurt school?                             | 10 |
| 8. | a) What is Environmental philosophy?  | 05 |
|    | b) What are the problems of environmental philosophy?                           | 15 |
|    | c) How important is environmental philosophy in solving environmental problems? | 15 |

Khulna University of Engineering & Technology

Department of Architecture

B. Arch 2<sup>nd</sup> Year 2<sup>nd</sup> Term Regular Examination, 2022

Course No: URP 2225 Course Title: Urban Planning Principles

Full Marks: 210

Time: 03 Hours

- N.B. i) Answer any three questions from each section in separate script  
ii) Figures in the right margin indicate full marks



Section-A

1. a) Describe the scopes of Urban Planning. 13  
b) Write down the differences and similarities among garden city, satellite town and new town. 12  
c) Mention some characteristics of Successful Urban Planning? 10
2. a) Discuss the characteristics of a Satellite Town. 15  
b) Describe the tools of urban congestion management. 12  
c) Write down the features of neighborhood concepts that have been developed in Khulna city. 08
3. a) Discuss about the type of neighborhood development Khulna city is experiencing due to Khulna Rail connection? 13  
b) Briefly describe the types of city open spaces. 14  
c) If you want to recommend recreational facilities for Khulna city similar to the Indian cities, how much space will you preserve in the master plan for recreational purposes? 08
4. a) Mention the factors you will consider while selecting the site for an airport. 10  
b) Khulna Railway Station can be used by all types of users as it has been designed to meet the demand of all user priorities. Justify the statement with proper examples. 15  
c) What is the difference between Bus Terminal and Station? Mention the data requirement for Bus Terminal Design. 10

Section-B

5. a) What do you mean by Urban system? Narrate the law of primate cities with necessary example. 15  
b) "Germany is a better fit for rank size rule." Justify the statement. 05  
c) Illustrate various types of towns according to physical pattern with necessary sketches. 15
6. a) Why has hexagonal shape suggested for the market area in "Central Place Theory"? Explain with necessary diagram. 10  
b) Briefly explain the three principles of "Central Place Theory" with necessary sketches. 15  
c) "The concept of industrial agglomeration enhances and facilitates the realization of economics of scale in economic activities." Justify the statement. 10
7. a) Write a short overview of road classification provide by Local Government Engineering Department (LGED) of your country. 12  
b) Vehicular Mobility Gradually increase and land access decreases from local roads to arterials." Explain using necessary diagram. 08  
c) Provide a brief discussion on the function of the shoulder, median and lay by of a roadway. 15
8. a) "Location of industry can be controlled on influenced by concession." Explain with necessary examples. 08  
b) Present a case study illustrating the concept of industrial agglomeration and subsequently, provide a concise analysis of both its benefit and drawback. 15  
c) "Eco-industrial Parks seek to minimize energy use, waste generation, operating costs and other environmental impacts." Justify the statement. 12

Khulna University of Engineering & Technology

Department of Architecture

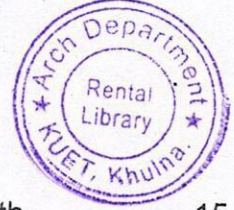
B. Arch 2<sup>nd</sup> Year 2<sup>nd</sup> Term Regular Examination, 2022

Course No: Arch 2251 Course Title: Architectural Acoustics

Full Marks: 210

Time: 03 Hours

- N.B i) Answer any three questions from each section in separate script  
ii) Figures in the right margin indicate full marks



Section-A

1. a) What happens when sound wave hits a surface? Briefly discuss with illustrations including different surfaces. 15
- b) 'Design for the ear'- Describe the idea focusing on education and health. 15
- c) Write short note on 'Reverberation Time'. 05
2. A computer lab room of 40'X30' with height of 15' has absorption co-efficient of 0.2, 0.03, 0.1 for walls, ceiling and floor respectively. What would be the reduction in reverberation time if 70% of the ceiling gets treated with a material with absorption co-efficient of 0.9. 35
3. a) A car is blowing its horn at 80 dB from 10' distance. To hear the horn 56 dB, what distance one need to move from the car? 10
- b)  $NR = TL + \log(a_2/s)$ , NR= (Noise Reduction), is dependent on three basic factors, describe them shortly. 10
- c) A laboratory has 500 Sabins of absorption and an adjacent machine room producing 90dB sound level has a shared area of 200 ft<sup>2</sup> and a transmission loss of 40 dB, find the sound level in the laboratory. 15
4. a) How does the decay of sound relate to the distance? Describe in detail with the help of the inverse-square law. Use illustration if needed. 20
- b) What is sound intensity level? Why decibel is the unit of sound intensity level? How it is calculated, describe in detail. 15

Section-B

5. a) What are the basic acoustic goals? Draw a sectional perspective of an Amphitheatre indicating its acoustical features. 10
- b) Explain 'Haas effect' and acoustic wave propagation 2D model for the Epidaurus theatre with necessary illustrations. 25
6. a) Discuss the pattern of reflected sound for different type of reflectors. Include relevant diagrams. 15
- b) Why room acoustics is important for your studio? Discuss the measures of controlling echo with proper sketches. 20
3. a) What is sound isolation? 05
- b) Discuss the major sources of noise in architecture. How earth berms work as noise barrier in different cases? Explain with neat sketches. 20
- c) 'Proper arrangement of balconies and overhangs can be an effective measure for noise control'- explain briefly. 10
4. a) Explain the following phenomena (Any five): 05
  - i) Formation of echoes X7
  - ii) Sound foci =35
  - iii) Dead spots
  - iv) Reverberation
  - v) Insufficient loudness
  - vi) Ray Diagram Graphics

Khulna University of Engineering & Technology

Department of Architecture

B. Arch 2<sup>nd</sup> Year 2<sup>nd</sup> Term Regular Examination, 2022

Course No: Arch 2231 Course Title: Islamic Architecture in the Indian Subcontinent

Full Marks: 210

Time: 03 Hours

- N.B i) Answer any three questions from each section in separate script  
ii) Figures in the right margin indicate full marks



Section-A

1. a) What is Islamic Architecture? Who introduced it in this subcontinent? 10  
b) Discuss the history of Islamic Architecture in the Indian Subcontinent and mention the key characteristics of it. 25
2. a) Elaborate the architectural features of Quwat-ul-Islam Mosque. Use plan and relevant sketches to show its expansion in different phases. 20  
b) What is the 'Squinch system'? Discuss it with the example of the tomb of Iltutmish. 15
3. a) Illustrate the plan and elevation of Alai Darwaja featuring its architectural characteristics. 25  
b) Explain the architectural features of Hooghly Imambara in West Bengal. 10
4. a) Write short notes with relevant sketches: 7.5x2  
i) Khirki Masjid =15  
ii) Tomb of Telengani  
b) Elaborate the architectural features of the Garden Tomb of Sikandar Lodi with neat sketches. 20

Section-B

5. a) "Jahangiri Mahal, a tree synthesis of Timurid, Persian and Indian traditions" – Elaborate the statement with evidence and illustrations. 20  
b) What architectural contributions did the emperor Jahangir bring to the Mughal Garden? Explain with necessary sketches. 15
6. a) "Qila Kumha Mosque is considered as water-marked of Pre-Mughal Mosque architecture in terms of craftsmanship" – Give your opinion with illustrations. 25  
b) Draw the elevation of the "Tomb of Sher Shah Sur" and indicate the Lodi-style architectural characteristics. 10
7. a) What is the concept of "Nine-fold Plan"? 05  
b) "Humayun's Tomb represents an Indian interpretation of a Persian Conception." – Justify your opinion with evidences and illustrations. 30
8. a) Describe the architectural features with illustrations: 10+10  
i) Diwan-i-khaas = 20  
ii) Punch Mahal  
b) Draw the masterplan and briefly describe the zoning layout of 'Fatehpur Sikri'. 15