

Khulna University of Engineering & Technology

Department of Architecture

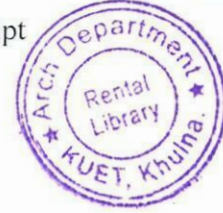
B. Arch 2nd Year Special Backlog Examination, 2022

Course No: Hum 2125 Course Title: Principles of Economics

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) The following equations are for the demand and supply of a good x: 35

$$Q_d = 1800 - 2P_x \text{ and } Q_s = 300 + 3P_x$$

- i) Define law of demand and law of supply.
 - ii) How do income of the consumer, prices of related goods, taste affect the demand?
 - iii) Define market equilibrium. Calculate equilibrium price (P) and quantity (Q).
 - iv) How do technology and government policy affect the supply of good x?
2. a) Explain the concept of microeconomics and macroeconomics. 10
b) Elucidate on the basic economic problems with relevant examples. 10
c) Discuss the different economic system. 15
3. a) What is production and production function? 05
b) Explain the importance of capital and role of an entrepreneur in the production process. 10
c) "A rational producer will always produce in stage -2" - Explain with necessary figure. 20
4. a) Define market. Distinguish between monopoly and perfect competition. 10
b) Explain the following situation in the short-run under perfect competition: 25
i) Super normal profit
ii) Shut down position

Section-B

5. a) "Higher savings lead to higher standard of living" - Explain. 15
b) Distinguish between induced investment and autonomous investment. 10
c) Distinguish between GNP and GDP. 10
6. a) Discuss the different methods of measuring national income. 20
b) Describe the major problems of measuring national income in Bangladesh. 15
7. a) Define inflation. What are the main causes of inflation? 10
b) How is Consumer Price Index (CPI) used in measuring inflation? 10
c) Discuss the economic consequence of inflation. 15
8. a) What are real and nominal GDP? Which is the better measure of economic well-being? Why? 20
b) Explain how commercial banks create credit. 15

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B. Arch 2nd Year Special Backlog Examination, 2022

Course No: CE 2225 Course Title: Structure II

Full Marks: 210

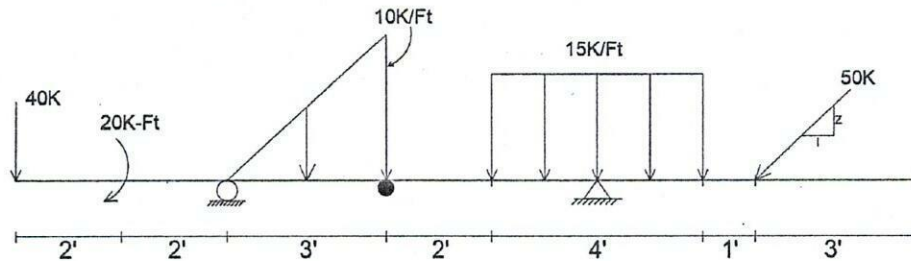
Time: 03 Hours

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

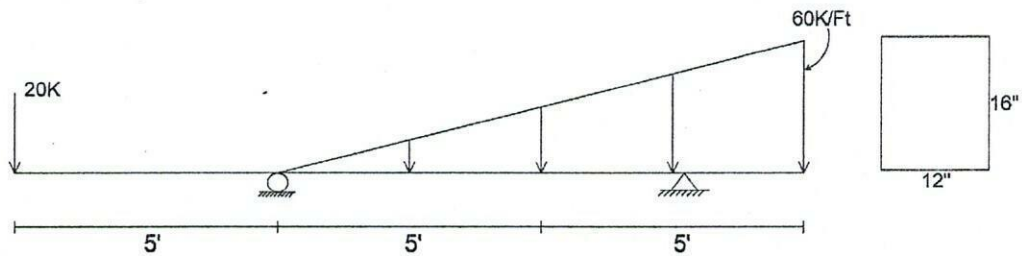


Section-A

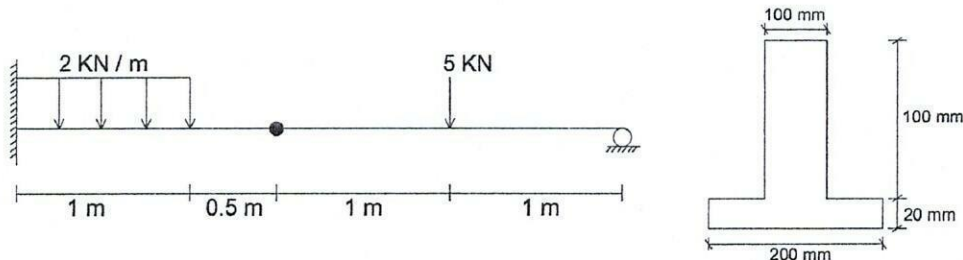
1. a) What is pure bending? 05
 b) Draw the shear force & bending moment diagrams for the following loaded beam. 30



2. a) What are the different types of supports? Show with neat sketches. 05
 b) Determine the maximum shearing stress that will be developed in the following beam. If the maximum limit of the shearing stress in the beam is 2000 psi, what necessary steps you need to take so that the structure wont fail. 30



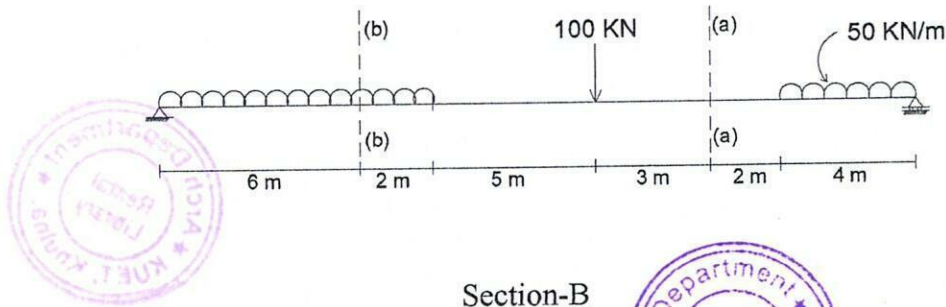
3. a) Derive the relationship between load, shear & moment 10
 b) Determine the maximum developed stress for both tension (σ_t) & compression (σ_c). For the following beam. 25



4. a) Prove the bending stress $\sigma = \frac{M c}{I}$, where the symbols bear their usual meaning. 10
 b) Define the following terms: 10
 i. Shear Force
 ii. Point of Contra-flexure

- iii. Inflection Points
- iv. Shear Force
- v. Bending Moment.

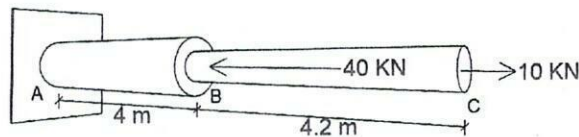
- c) Calculate shear force, and bending moment at section a-a and b-b for the following beam as shown in figure. 15



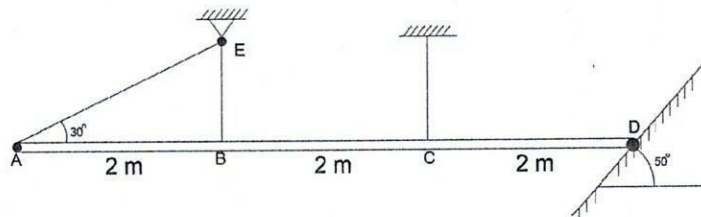
Section-B

5. a) Define the following terms: 06
- i. Normal stress
 - ii. Shearing Stress

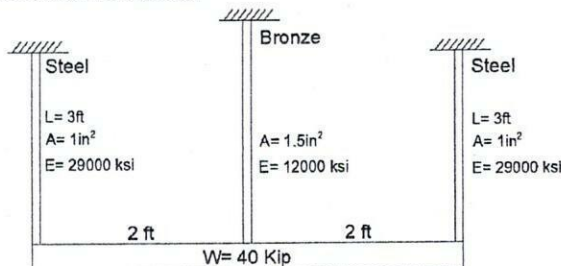
- b) The composite bar shown in figure is made of two segments, AB and BC having cross-sectional area of $A_{AB} = 200 \text{ mm}^2$ and $A_{BC} = 100 \text{ mm}^2$. Their Young's moduli are $E_{AB} = 100 \text{ GPa}$ and $E_{BC} = 210 \text{ GPa}$ respectively. Find the total displacement at the right end. 15



- c) The homogenous bar ABCD shown in figure is supported by a cable that runs from A to B around the smooth peg at E, a vertical cable at C, and a smooth inclined surface at D. Determine the mass of the heaviest bar that can be supported if the stress in each cable is limited to 100 MPa. The area of the cable AB is 250 mm^2 and that of the cable at C is 1300 mm^2 . 14

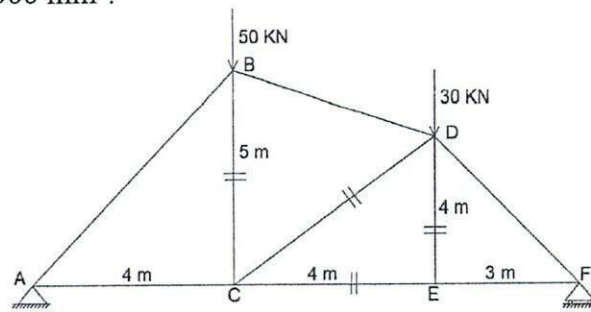


6. a) Draw a typical stress-strain diagram of mild steel and describe its various features. How can you determine the yield point of brittle materials? 15
- b) The lower ends of three bars as shown in figure are the same level before the uniform rigid block weighting 40 kips is attached. Determine (i) The length of the bronze bar so that the load on each steel bar is twice the load on the bronze bar. (ii) The length of the bronze that will make the steel stress twice the bronze stress. 20



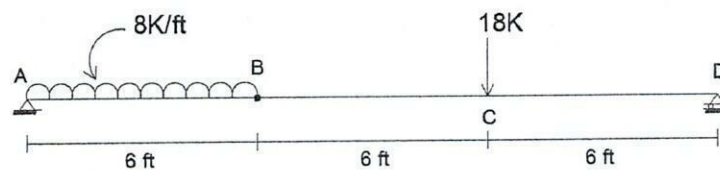
7. a) State and describe second area moment theorems. 15

- b) What are the assumptions used in truss analysis? For the truss shown in figure find the stress in members BC, CD, CE and DE. The cross-sectional area for each member is 300 mm^2 . 20



8. a) Define the following terms: (i) Elastic weight and (ii) Elastic Curve. 04

- b) A steel beam is loaded as shown in figure calculate the slope at A and D, deflection at B and C. Assume, $E = 29 \times 10^6 \text{ Psi}$; $I = 341 \text{ In}^4$ 31



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Department of Architecture

B. Arch Special Backlog Examination, 2023

Course No: Hum 2225 Course Title: Philosophy

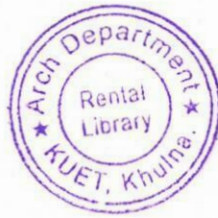
Full Marks: 210

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 meant by Philosophy? | 10 |
| | b) Discuss the nature of Philosophy. | 15 |
| | c) Explain the method of Dogmatism. | 10 |
| 2. | a) What is epistemology? | 10 |
| | b) 'I think therefore I exist'-Explain this quotation. | 10 |
| | c) Explain critically Kant's theory regarding the origin of knowledge. | 15 |
| 3. | a) Explain skepticism as the method of philosophy. | 10 |
| | b) Explain the theory of impressionism and ideas of David Hume. | 10 |
| | c) Explain the main features of empiricism and rationalism. Can they be reconciled? | 15 |
| 4. | a) What is knowledge? | 10 |
| | b) Explain and evaluate Authoritarianism as a theory of the origin of knowledge. | 10 |
| | c) 'Man is the measure of all things'-Explain the statement of Protagoras. | 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) Explain briefly common characteristics of Indian philosophy. | 15 |
| | b) Distinguish between creation and evolution of the origin of the world. Which one do you like? | 10 |
| | c) Give a critical exposition of Darwin's theory of evolution. | 10 |
| 7. | a) What is phenomenism? | 10 |
| | b) What are the differences between phenomenism and existentialism? | 15 |
| | c) Explain the importance of 'Confucianism' of Chinese society. | 10 |
| 8. | a) What is environmental philosophy? | 10 |
| | b) Why should we study Environmental philosophy? Explain it with example. | 10 |
| | c) Briefly discuss the orthodox schools of Indian philosophy. | 15 |

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B. Arch 2nd Year Special Backlog Examination, 2022

Course No: CE 2125 Course Title: Structure I : Mechanics

Full Marks: 210

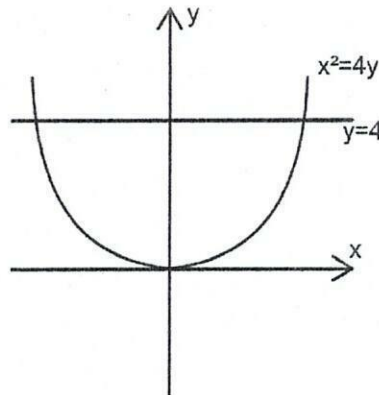
Time: 03 Hours

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



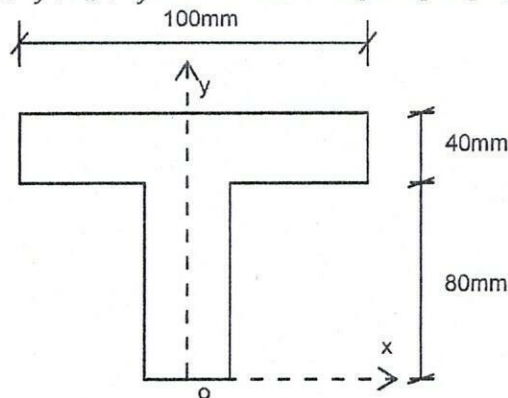
Section-A

- Define the principle of symmetry. Elaborate with an example. 10
 - Find out the location of centroid (\bar{x}, \bar{y}) for a rectangle. 10
 - Find out the centroid of the shape formed from the equation,
 $y^2 = 36x$
 $x^2 = 36y$ 15
- Prove that, $I = \bar{I} + Ad^2$, Where the symbols bear their usual meanings. 10
 - Prove that for a rectangle the moment of inertia, $I_x = \frac{bh^3}{3}$; Where the symbols bear their usual meanings. 10
 - Determine the I_x, I_y for the following shape. [Figure 02 (c)] 15



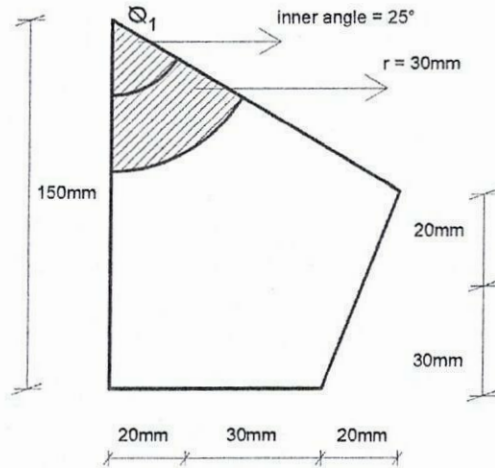
[Figure 2 (c)]

- Determine the moment of inertia of a circular arc about a dimensional axis, where the radius of the arc is "r". 10
 - Determine the $I_x, I_y, I_{\bar{x}}, I_{\bar{y}}$ for the following shape. [Figure 03 (b)] 25



[Figure 3 (b)]

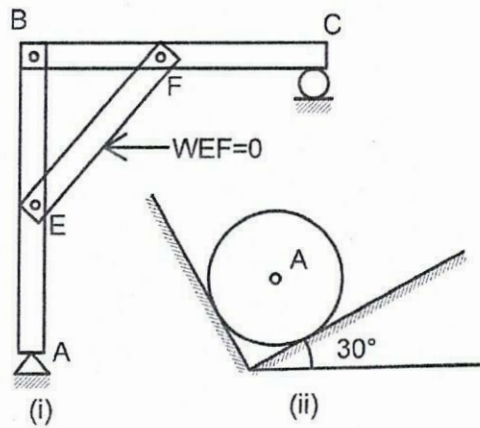
4. a) Prove that, for any arbitrary shape the centre of gravity is $\bar{x} = \int xdw/w$; & $\bar{y} = \int ydw/w$ 10
 b) Locate the centroid of two lines $x = y$ & $x = 4$. 10
 c) Find the centroid of the unshaded portion of the following figure. (only for the Y 15
 axis). [Figure 04 (c)]



[Figure 4 (c)]

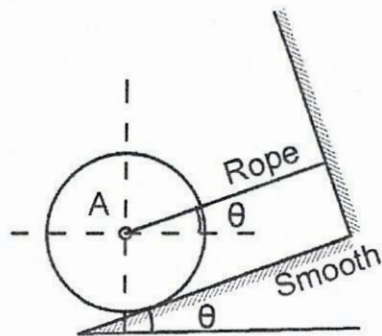
Section-B

5. a) Describe different types of force system with appropriate figure. 10
 b) Draw the free body diagram of the members as shown in the following figure. 10



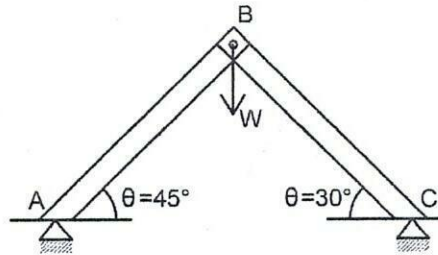
[Figure 5 (b)]

- c) A 500lb cylinder 'A' rests on a smooth inclined plane. For a tension in the rope of 450lb, find the inclination of the plane and plane reaction. [Figure 5 (c)] 15



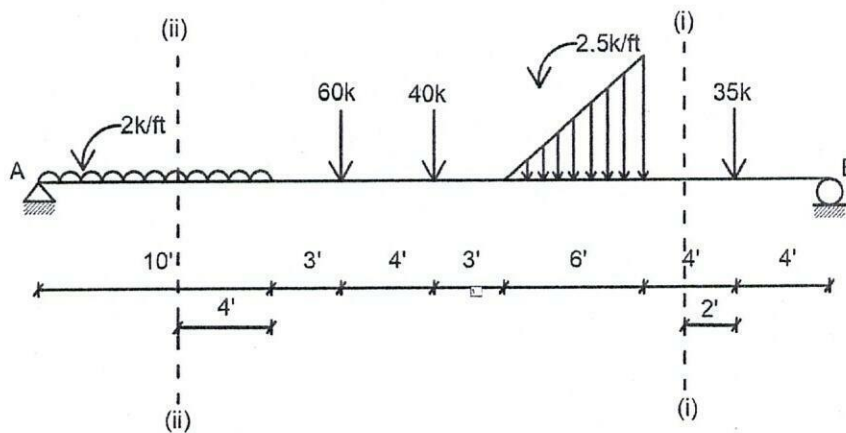
[Figure 5 (c)]

6. a) Define the following terms: 12
 i) Two force member,
 ii) Moment of a force,
 iii) Shear force,
 iv) Bending moment
- b) Describe the principle of transmissibility of force. 08
- c) The permissible internal force on timber **BC** is **6 kips**. If $\theta = 45^\circ$, what maximum safe load may be suspended at **B**? [Figure 6 (c)] 15



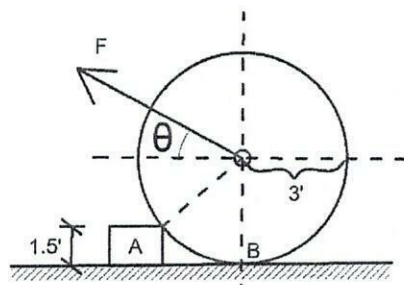
[Figure 6 (c)]

7. a) What is support? Write down various types of support and their properties. 09
- b) Draw comparative **stress-strain diagram** for different materials. 06
- c) A simply supported beam is loaded as shown in the figure below. Also determine the **shear force** and **bending moment** at section (i)-(i) and (ii)-(ii). [Figure 7 (c)] 20



[Figure 7 (c)]

8. a) Write down the name of various types of beams. 04
- b) Differentiate between- 16
 i) Engineering stress and true stress
 ii) Strain and deformation
 iii) Proportional limit and elastic limit
 iv) Plasticity and elasticity
- c) A 3000lb wheel with a radius of 3ft is acted upon by a force **F**, which tends to pull the wheel over the obstruction at **A**. At the instant the wheel is about to move, the pressure between the wheel and the ground is zero. What is the magnitude of the force **F** at this instant If $\theta = 30^\circ$? [Figure 8 (c)] 15



[Figure 8 (c)]