

4E4114

Roll No. _____

Total No of Pages: 3

4E4114

B. Tech. IV Sem. (Back) Exam., May - 2019

Civil Engineering

4CE4A Surveying - I

Time: 3 Hours

Maximum Marks: 80

Min. Passing Marks: 24

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/calculated must be stated clearly.

*Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*

1. NIL

2. NIL

UNIT- I

Q.1 (a) What is surveying? Discuss in brief the principle of surveying. [8]

(b) Differentiate plane surveying and Geodetic surveying. [8]

OR

Q.1 (a) What is tape? Discuss various types of corrections for tape measurements. [8]

(b) What do you mean by chain adjustment? Discuss various types of chain. [8]

UNIT- II

Q.2 Write short note on (Any Two)

- (a) Reference meridian [8]
- (b) Bearing [8]
- (c) Magnetic Declination [8]

OR

- Q.2 (a) Describe the process of permanent adjustment of Vernier Theodolite [8]
- (b) Draw and explain neat sketch of prismatic compass. [8]

UNIT- III

Q.3 What is traversing? Discuss Detail Notes on methods of traversing. [16]

OR

- Q.3 (a) Explain the methods of computation and adjustment of traverse –
- (i) Bowditch Rule [4]
 - (ii) Graphical Method [4]
- (b) Explain Axis Method for computation and adjustment of traverse. [8]

UNIT- IV

Q.4 What is principle of levelling? Discuss in brief types of levelling. [16]

OR

- Q.4 (a) Explain source of error in levelling Curvature & Refraction correction. [8]
- (b) Explain Temporary and Permanent adjustment of dumpy level. [8]

UNIT- V

Q.5 What do you understand by plane table surveying? Discuss Various Methods of plane table surveying. [16]

OR

Q.5 What do you mean by contouring? Discuss various methods of locating contours. [16]

4E1207

Roll No. _____

Total No of Pages: **3**

4E1207

B. Tech. IV - Sem. (Main) Exam., May - 2019

ESC Civil Engineering

4CE3-04 Basic Electronics for Civil

Engineering Applications

Time: 2 Hours

Maximum Marks: 80

Instructions to Candidates:

Attempt all five questions from Part A, four questions out of six questions from Part B and two questions out of three from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

*Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*

1. NIL

2. NIL

PART – A

(Answer should be given up to 25 words only)

[5×2=10]

All questions are compulsory

- Q.1 State De-Morgan's theorem. [2]
- Q.2 Explain the difference between Gross error and Systematic errors. [2]
- Q.3 Explain why digital system is better than Analog systems? [2]
- Q.4 Explain the pre-processing and enhancement with respect to Digital Image Processing. [2]
- Q.5 Explain the basic principle of Strain Gauge. [2]

PART – B

(Analytical/Problem solving questions)

[4×10=40]

Attempt any four questions

- Q.1 (a) Convert $(47.375)_{10}$ to Hexadecimal [10]
(b) Gray code $(1010110)_2$
(c) Subtraction using octal $45600 - 13271$
(d) Convert $(0.125)_{10}$ to octal
(d) Subtraction using $(11B)_{16}$ from $(2A5)_{16}$
- Q.2 Write the Applications of optical and microwave remote sensing techniques in civil Engineering. [10]
- Q.3 Describe the various types of sensors used for displacement, velocity and acceleration. [10]
- Q.4 Explain the following terms: [10]
(a) Absolute error
(b) Relative error
(c) Accuracy and precision
(d) Significant figures
- Q.5 Give the brief comparison between CC, CB and CE transistor configurations. [10]
- Q.6 Explain the following sensors: [10]
(a) Ultrasonic sensor
(b) Electromagnetic sensor
(c) Laser sensor
(d) Thermal sensor

PART – C**(Descriptive/Analytical/Problem Solving/Design Questions)** [2×15=30]**Attempt any two questions**

Q.1 Explain the following: [15]

- (a) R-S flip flop
- (b) J-K flip flop

Draw its logic circuit and explain its working with suitable truth table.

Q.2 Describe the control surveys using GNSS with respect to electronic instrumentation.

Also explain the use of automatic and digital levels. [15]

Q.3 Explain the following terms: [15]

- (a) Dynamic Measurement
- (b) Numerical and Graphical data processing
- (c) Archiving

Also explain, how these terms plays important role in Data Acquisition system and Data processing.

4E4111

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Total No of Pages: **4****4E4111****B. Tech. IV Sem. (Back) Exam., May - 2019****Civil Engineering****4CE1A Strength of Materials - II****Time: 3 Hours****Maximum Marks: 80****Min. Passing Marks: 24***Instructions to Candidates:*

Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. NIL2. NIL**UNIT - I**

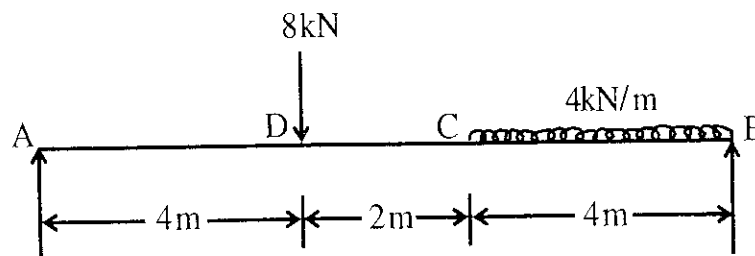
Q.1 (a) Prove that: $EI \frac{d^2y}{dx^2} = M$ [4]

(b) A beam AB of 10 m span is simply supported at the ends and is loaded as shown in Fig. 1. Determine

- (i) Deflection at C
- (ii) Maximum deflection and
- (iii) Slope at end A.

Take $E = 2 \times 10^5 \text{ N/mm}^2$ and $I = 2100 \text{ cm}^4$

[12]

**OR**

- Q.1 (a) A Cantilever 3m long is loaded as shown in Fig. 2. Calculate the deflection at the end if the section is rectangular. 150 mm \times 300 mm. Take $E = 0.2 \times 10^5 \text{ N/mm}^2$. [8]

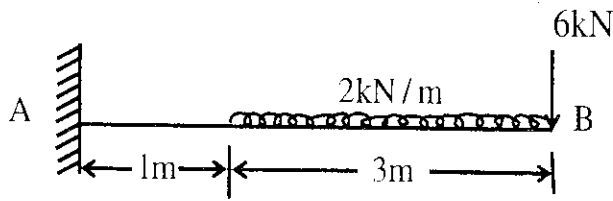


Fig. - 2

- (b) Using the conjugate Beam method determine. The slopes at the ends and the deflection at the mid-span of a simply supported beam - carrying UDL. $w \text{ kN/m}$ throughout its length. Also plot the slope and deflection diagrams for the beam. [8]

UNIT - II

- Q.2 (a) A cantilever AB is fixed at end A and rigidly propped at end B. Find
 (i) The prop reaction and
 (ii) Maximum bending moment. Also Draw the SFD & BMD. [12]
- (b) What is Retaining Wall? And briefly explain types of Retaining wall. [4]

OR

- Q.2 A Short C.I. column has a rectangular section 160 mm \times 200 mm with a circular hole of 80 mm diameter as shown in Fig. 3. It carries an eccentric load of 100kN located as shown in Fig. Determine the values of the stresses at the four corners of the section. [16]

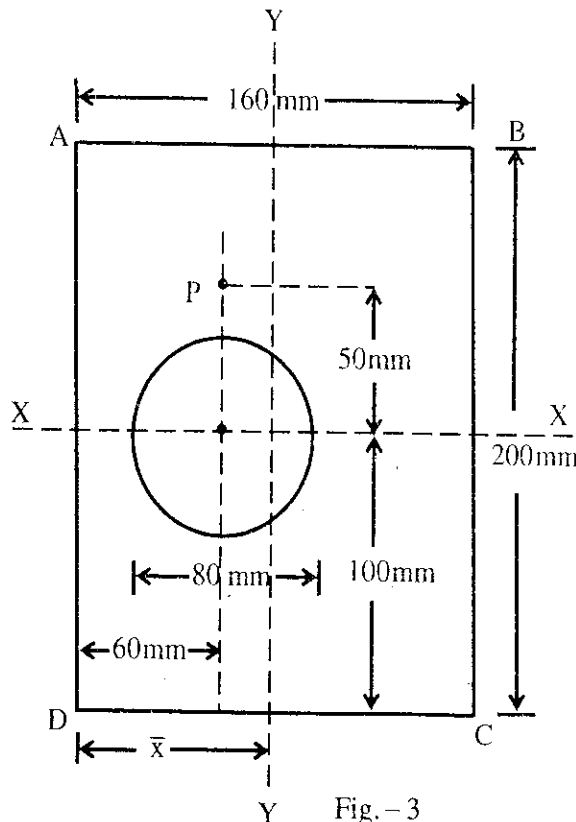
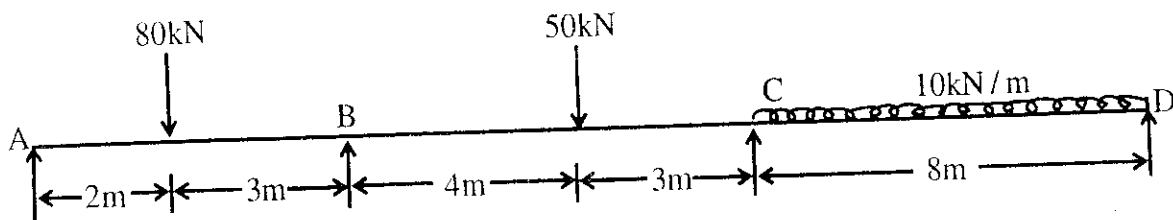


Fig. - 3
Page 2 of 4

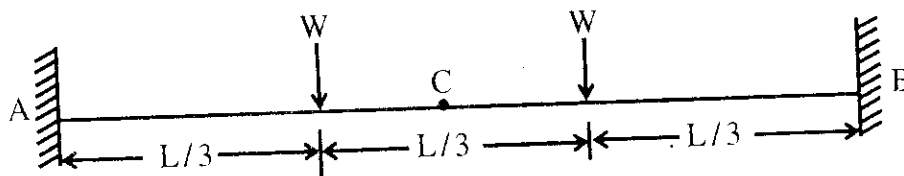
UNIT- III

- Q.3 For the continuous beam shown in Fig. 4, determine the support moment at B and C. Also Draw the SFD & BMD. [16]



OR

- Q.3 (a) Find the support moments of a built-in beam loaded at third points by two point loads W each. Also, draw the B. M. and S. F. diagrams and compute the deflection at the centre. Shown in Fig. 5 [14]



- (b) Differentiate the simply supported beam and Fixed Beam. [2]

UNIT- IV

- Q.4 (a) Write the assumptions for torsion in shaft. [6]
(b) A hollow steel shaft 5m long is to transmit 160 kW of power at 120 r. p. m. The total angle of twist is not to exceed 2° in this length and the allowable shear stress is 50 N/mm^2 . [10]

OR

- Q.4 (a) Derive expression for the axial movement of open coiled helical spring under axial force W . [8]

- (b) A close coiled helical spring is to have a stiffness of 900 N/m in compression with a maximum load of 45 N and a maximum shearing stress of 120 N/mm². The "Solid" length of the spring (i.e. coils touching) is 45 mm. Find the wire diameter, mean coil radius and number of coils. Take $G = 40000 \text{ N/mm}^2$. [8]

UNIT- V

- Q.5 (a) Explain the D'Alembert's principle and its Application [4]
(b) Compute the stiffness of spring in series and Parallel Arrangements. [6]
(c) Explain the force & free vibration. [6]

OR

- Q.5 Write the Short Notes: (any four) [16]
(a) Logarithmic Decrement
(b) Oscillation
(c) Degree of freedom.
(d) The vibration isolation.
(e) Resonance

4E1208

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Total No of Pages: 7

4E1208

B. Tech. IV - Sem. (Main) Exam., May - 2019

PCC Civil Engineering

4CE4 – 05 Strength of Materials

Time: 3 Hours

Maximum Marks: 120

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of seven questions from Part B and four questions out of five from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL

2. NIL

PART – A

(Answer should be given up to 25 words only)

[10×2=20]

All questions are compulsory

Q.1 Express the term Proof stress & yield point.

Q.2 Give the difference between deformation & strain.

Q.3 Write the application of Mohr's Circle.

Q.4 State the point of contra-flexure & point of inflection.

Q.5 Write the principle of simple bending.

Q.6 Write the assumption of Euler's theory for columns.

Q.7 Write the modes of failure of a column by crushing & buckling.

Q.8 Describe Torque & application of Torsion. Also write the torsion formula.

Q.9 Which method is effective method for finding out the deflection & why?

Q.10 Write the Mohr's second theorem.

PART - B

(Analytical/Problem solving questions)

[5×8=40]

Attempt any five questions

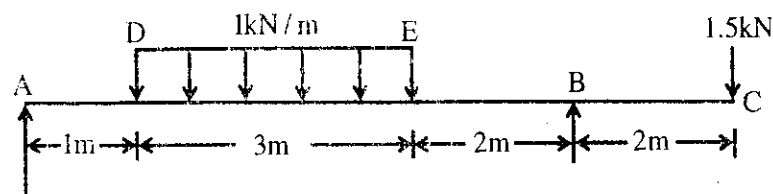
Q.1 An overhanging beam ABC, supported at A and B is loaded as shown in figure (1).

Determine by double integration method.

(i) Deflection at free end C

(ii) Maximum deflection between A & B

Take $E = 2 \times 10^5 \text{ N/mm}^2$ and $I = 450 \text{ cm}^4$



Q.2 A simple beam AB is acted upon by couples μ and 2μ at the ends, as shown in figure (2). Determine by Area moment method:

- (i) Slopes at A and B
- (ii) Deflection at the mid-span

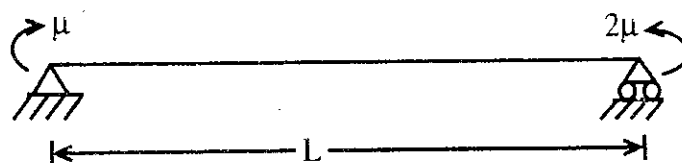


Figure (2)

Q.3 A shaft is transmitting 100 kW at 180 r.p.m. If the allowable stress in the material is 60 N/mm^2 , determine the suitable diameter for the shaft. The shaft is not to twist more than 1° in a length of 3 metres. Take $G = 80 \text{ N/mm}^2$.

Q.4 Derive the equation of critical load, when one end is fixed and the other end is hinged.

Q.5 Construct the S.F. and B.M. diagrams for the beam shown in figure (3) and mark the values of the important ordinates.

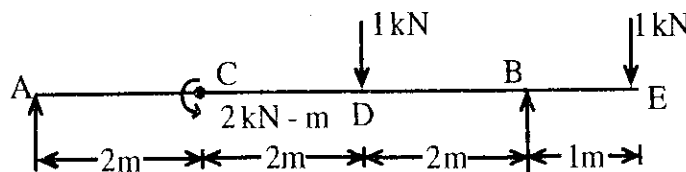
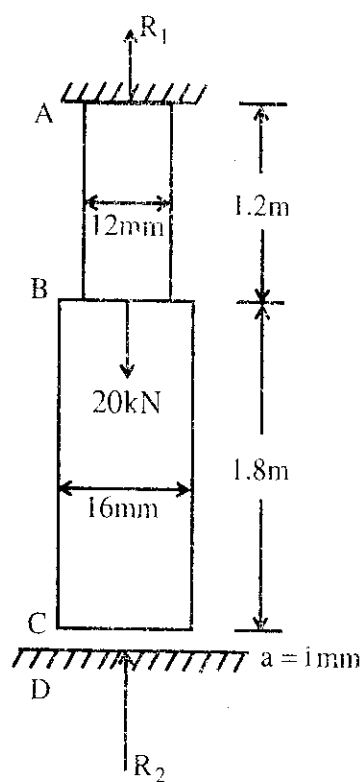


Figure (3)

Q.6 A composite bar ABC, rigidly fixed at upper support at A and hanging 1mm above the lower support D, is loaded as shown in Fig (4). Determine the reaction at the two supports and stresses in two sections.

Take $E = 2 \times 10^5 \text{ N/mm}^2$. The diameter of upper portion AB is 12mm and that of lower portion BC is 16mm.



Q.7 At a point in a loaded specimen, the principle stresses acting on two mutually perpendicular planes are 90 N/mm^2 and 60 N/mm^2 both being compressive. Determine the resulting stress acting on a plane inclined at 60° measured clockwise to the plane on which the larger normal stress is acting.

PART – C

(Descriptive/Analytical/Problem Solving/Design Questions) [4×15=60]

Attempt any four questions

Q.1 Derive the secant formula by theoretical approach for columns.

Q.2 A beam, simply supported at the ends, is subjected to a point load $\frac{W}{2}$, eccentrically placed as shown in figure (5). Determine:

- (a) Slopes at the ends
- (b) Deflection under the load
- (c) Central deflection
- (d) Maximum deflection and its location

Solve this problem by using conjugate beam method & draw bending moment diagram in each case.

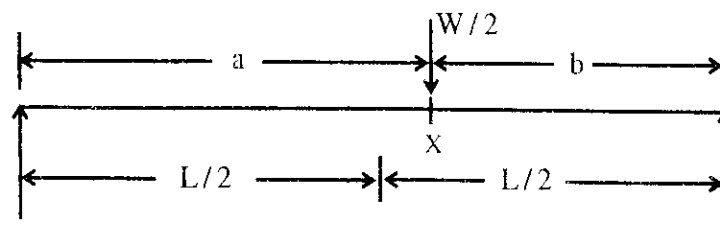


Figure (5)

Q.3 A beam ABCD is supported at A, C and D, has an internal hinge at B and is loaded as shown in figure (6). Draw the Bending moment and shear force diagrams, showing clearly the position and magnitude of maximum B.M. in the beam.

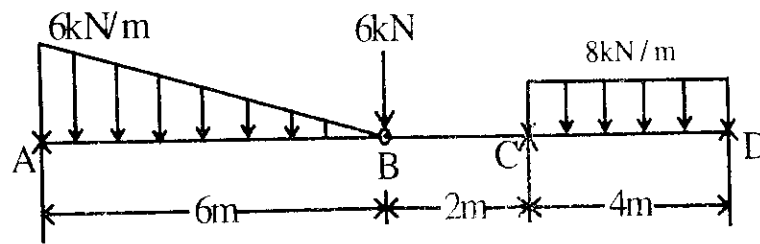


Figure (6)

Q.4 A rigid bar ABC is hinged at A and attached to brass bar BF (length 0.35m, area 400mm^2) and steel bar CD (length 0.3m and area 250mm^2). The temperature of brass bar BF is lowered by 30K and that of bar CD is raised by 30K. Neglecting any possibility of lateral buckling, find the normal stresses in the brass and steel. Take $E = 0.9 \times 10^5 \text{ N/mm}^2$ and $\alpha = 20 \times 10^{-6}$ per K for brass, and $E = 2 \times 10^5 \text{ N/mm}^2$ and $\alpha = 12 \times 10^{-6}$ per K for steel. Refer figure (7).

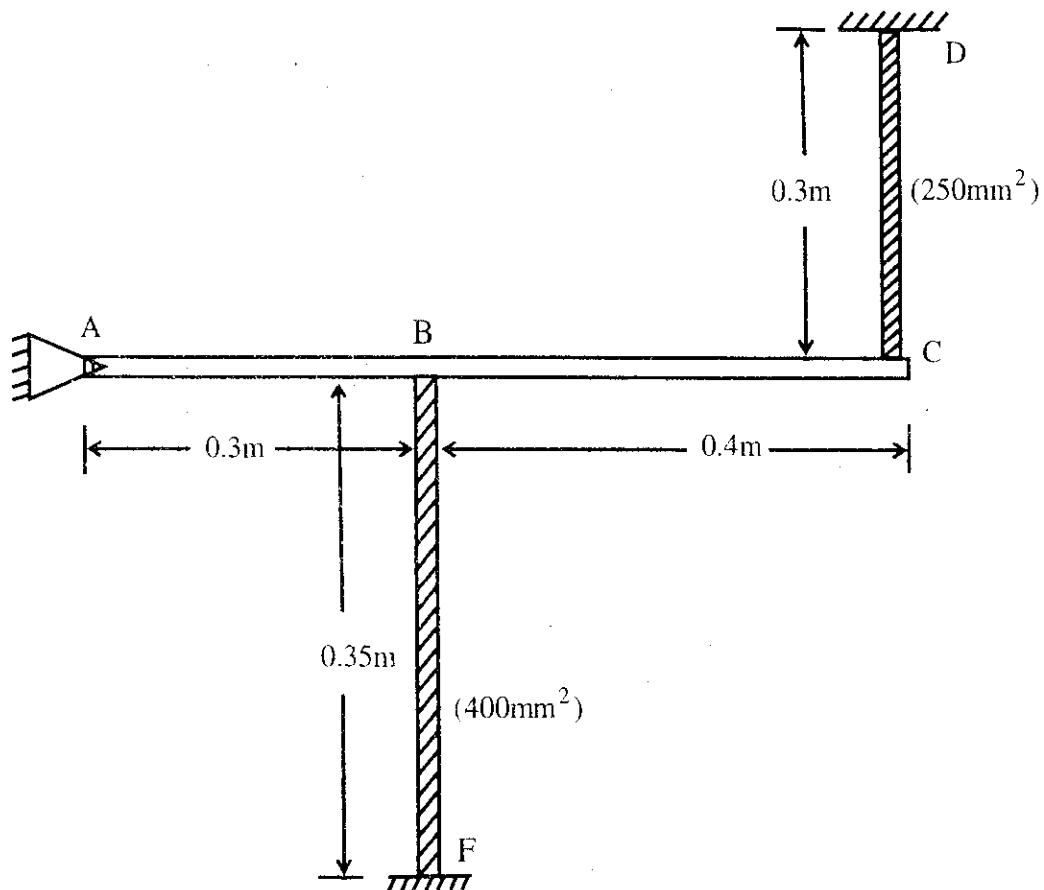


Figure (7)

Q.5 Compute the normal, shear and resultant stresses on any inclined plane by graphical method. Also write the procedure for construction of Mohr's circle and draw it.

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Total No of Pages: 3

4E1209

B. Tech. IV - Sem. (Main) Exam., May - 2019

PCC Civil Engineering

4CE4 – 06 Hydraulics Engineering

Time: 3 Hours

Maximum Marks: 120

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of seven questions from Part B and four questions out of five from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

*Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*

1. NIL

2. NIL

PART – A

(Answer should be given up to 25 words only)

[10×2=20]

All questions are compulsory

- Q.1 Explain distorted model and undistorted model.
- Q.2 Describe in brief Prandtl's mixing length theory.
- Q.3 Describe briefly what do you mean by smooth and rough boundaries.
- Q.4 Discuss Hydraulic Jump.
- Q.5 What are the various losses in Jump?
- Q.6 Explain draft tube with neat sketch.
- Q.7 Explain unit Hydrograph.
- Q.8 Describe various types of aquifers.
- Q.9 Describe various types of canals briefly.
- Q.10 Explain in brief well hydraulics.

PART – B

(Analytical/Problem solving questions)

[5×8=40]

Attempt any five questions

- Q.1 A river model is to be constructed to a vertical scale of 1:50 and a horizontal of 1:20. At the design flood discharge of $450\text{m}^3/\text{sec}$, the average width and depth of flow are 60m and 4.2m respectively. Determine the corresponding discharge in model using Reynolds's similarity.
- Q.2 What are various types of similarities?
- Q.3 In a fully rough turbulent flow in a 15cm diameter pipe. The centre line velocity is $2.5\text{m}/\text{sec}$. and the local velocity at mid radius is $2.28\text{m}/\text{sec}$. Find the discharge and the height of the roughness projections.
- Q.4 Describe critical, subcritical and supercritical flow with reference to specific energy curve.
- Q.5 A rectangular channel 2m wide carries discharge of $6\text{m}^3/\text{sec}$. Calculate critical depth and specific energy at this depth.
- Q.6 In a hydraulic jump in rectangular channel, the discharge per unit width is $2.5\text{m}^3/\text{sec}/\text{m}$ and depth before jump is 0.25m. Estimate:
- (a) Sequent depth
 - (b) Energy loss
- Q.7 Explain the mechanism of pelton wheel-turbine with neat sketch.

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PART – C

(Descriptive/Analytical/Problem Solving/Design Questions) [4×15=60]

Attempt any four questions

- Q.1 Explain centrifugal pump with neat sketch.
- Q.2 A Trapezoidal Channel is to be designed to convey $50 \text{ m}^3/\text{sec.}$ of water at velocity of 2 m/sec. The bed width to depth ratio is 8 and side slope is 1 horizontal to 1 vertical. It is lined with material having $n = 0.2$. Calculate bed width, depth of flow and slope of channel.
- Q.3 Describe the design steps of channels according to Kennedy's Theory.
- Q.4 What is runoff? Explain how will you determine runoff.
- Q.5 Describe Hydrological cycle with neat sketch.
-

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Total No of Pages: 3

4E4113

B. Tech. IV Sem. (Back) Exam., May - 2019

Civil Engineering

4CE3A Hydraulics & Hydraulic Machines

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks: 24

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/calculated must be stated clearly.

*Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*

1. NIL

2. NIL

UNIT-I

Q.1 (a) Compare the Rayleigh method and Buckingham's π theorem for Dimensional analysis. [8]

(b) Derive the expressions for any two dimension less number. [8]

OR

Q.1 (a) Determine the Dimensions of the quantities given below – [6]

(i) Angular Velocity

(ii) Angular acceleration

(iii) Discharge

(iv) Kinematic Viscosity

(v) Force

(vi) Specific gravity

(b) Explain the term – Distorted models and undistorted models. What is the use of Distorted Models? [6]

(c) In 1 in 40 model of a spillway, the velocity and Discharge are 2 m/sec and 2.5 m³/sec. Find the corresponding velocity and discharge in the prototype? [4]

UNIT- II

- Q.2 (a) Derive the expression for velocity Distribution for smooth and rough pipe. [8]
(b) Derive the equation for Velocity Distribution in a circular pipe. [8]

OR

- Q.2 (a) Define the Stanton Diagram and Moody's Diagram? [6]
(b) Find the relation between shear and pressure gradient. [6]
(c) In A pipe of diameter 125 mm, carrying water, the velocities at the pipe center and 25 mm from the pipe center are found to be 3.0 m/sec and 2.5 m/sec respectively. Find the wall shearing stress? [4]

UNIT- III

- Q.3 (a) Differentiate between – [2×4=8]
(i) Uniform flow and Non – uniform flow
(ii) Steady and unsteady flow
(iii) Laminar and turbulent flow
(iv) Critical or Sub – Critical flow
(b) Show that in a Rectangular channel – [8]
(i) Critical depth is $2/3$ of specific gravity
(ii) Fraude Number at critical depth is unity.

OR

- Q.3 (a) Explain the Geometric properties of Rectangular, Triangular, Trapezoidal and Circular channel with suitable example. [10]
(b) What do you understand by most economical section for open channel? [6]

UNIT- IV

- Q.4 (a) What are uses of Hydraulic Jump? [4]
- (b) A 9cm diameter jet having a velocity of 25 m/sec. strike a flat plate, the Normal of which is inclined at 45° to the axis of the jet. Find the normal force on the plate. [6+6=12]
- (i) When the plate is stationary
- (ii) When the plate is moving with a velocity 20 m/sec and away from the Jet?

OR

- Q.4 (a) Explain the terms of hydraulic Jump. And find an expression for loss of energy head for a hydraulic jump? [10]
- (b) Explain the terms [2×3=6]
- (i) Specific energy of a flowing fluid
- (ii) Critical velocity as applied to Non – uniform flow.

UNIT- V

- Q.5 (a) Differentiate followings in respect to turbines – [2×4=8]
- (i) Impulse Turbine and reaction turbine
- (ii) Turbine and pump
- (iii) Speed ratio and flow Ratio
- (iv) Hydraulic efficiency and Mechanical efficiency
- (b) Obtain an expression for the minimum speed for starting a centrifugal pump. [8]

OR

- Q.5 (a) Draw a neat sketch of governing of Pelton wheel turbine. [8]
- (b) Draw the neat sketch of a Kaplan turbine with its parts and explain its working. [8]
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4E4115

Roll No. _____

Total No of Pages: **2****4E4115****B. Tech. IV Sem. (Back) Exam., May - 2019****Civil Engineering****4CE5A Building Planning (Old Name-Building Technology)****Time: 3 Hours****Maximum Marks: 80****Min. Passing Marks: 24***Instructions to Candidates:*

Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. Table-9-SP-41 (S&T) - 19872. ½ size drawing sheet**UNIT- I**

Q.1 (a) Explain the criteria of site selection for a building and what do you mean by site plan? [8]

(b) State and discuss different sun-shading devices. [8]

OR

Q.1 (a) Discuss the different types of buildings in detail. [8]

(b) Write a short note on design of sun-shade. [8]

UNIT- II

Q.2 (a) What do you understand by climate? Explain elements of climate. [8]

(b) What do you mean by comfort? Describe thermal comfort. [8]

OR

Q.2 (a) Define building line and control line. [8]

(b) Write objects of building bye-laws. [8]

UNIT- III

- Q.3 (a) What do you mean by principles of planning? State and discuss factors affecting principles of planning. [10]
- (b) Write the factors considered in Vastu planning. [6]

OR

- Q.3 (a) Discuss prospect, circulation, elegance and privacy with respect to planning of a building. [8]
- (b) Explain design of a residential building as per Vastu. [8]

UNIT- IV

- Q.4 Design and draw the plan of a residential building on a plot of 12m. × 22m.. Road is on the North side of the plot. [16]

OR

- Q.4 Design and draw a primary school of 350 students capacity on a plot of 100m.×150m. Road is on the East side of plot. [16]

UNIT- V

- Q.5 (a) Explain lighting and ventilation requirements in a building. [8]
- (b) Explain firefighting provisions in a building. [8]

OR

- Q.5 (a) Write down various guide lines to be kept in mind for deciding the location of doors in a building. [8]
- (b) Explain the meaning of noise. Explain the methods of noise control. [8]
-

4E1210

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Total No of Pages: 3

4E1210

B. Tech. IV - Sem. (Main) Exam., May - 2019

**PCC Civil Engineering
4CE4 - 07 Building Planning**

Time: 2 Hours

Maximum Marks: 80

Instructions to Candidates:

Attempt all five questions from Part A, four questions out of six questions from Part B and two questions out of three from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

*Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*

1. half size sheet

2. NIL

PART - A

(Answer should be given up to 25 words only)

[5×2=10]

All questions are compulsory

Q.1 Define the term: -

[2]

- (a) Built of area
- (b) Carpet area
- (c) Super built up

Q.2 Write the different methods of drawing the sun chart. What is the utilization of sun chart?

[2]

Q.3 What are the acoustical defects in buildings? Explain in brief.

[2]

Q.4 Write short notes on:-

[2]

- (a) Grouping
- (b) Roominess
- (c) Circulation

Q.5 Write a short essay on Hot arid Zones.

[2]

PART – B

(Analytical/Problem solving questions)

[4×10=40]

Attempt any four questions

Q.1 Discuss the criteria for site selection for a building. How functions of a building affects site selection. [10]

Q.2 Write short notes on:-

[2.5×4=10]

- (a) Bi climatic chart
- (b) Elegance
- (c) Plinth regulation
- (d) Global climate

Q.3 What are the objectives of building by laws?

[10]

Q.4 Describe briefly the general principles underlying the noise control and various constructional measures adopted for achieving sound insulation in buildings. [10]

Q.5 Which factors should be considered while purchasing a residential building according to the Vastu Shastra? Why we move towards Vastu? [10]

Q.6 Explain how do you classify doors and windows from their operational point of view. [10]

PART – C

(Descriptive/Analytical/Problem Solving/Design Questions) [2×15=30]

Attempt any two questions

Q.1 Design and draw the plan of a residential building on a plot of 15m × 25m. Road is on the north side of the plot. [15]

Q.2 Classify the buildings based on occupancy and types of construction. [15]

Q.3 Discuss acoustical design of a cinema hall. Support your answer with neat sketch. [15]

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Total No of Pages: **3**

4E4112

B. Tech. IV Sem. (Back) Exam., May - 2019

Civil Engineering

4CE2A Concrete Technology

Time: 3 Hours

Maximum Marks: 80

Min. Passing Marks: 26

Instructions to Candidates:

*Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

*Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*

1. NIL

2. NIL

UNIT-I

Q.1 (a) What are the raw materials used for the production of cement? [8]

(b) What is soundness of cement and how is it tested? [8]

OR

Q.1 (a) Discuss the role of water cement ratio. [2]

(b) Describe the importance of Sieve analysis in determining particle size distribution. [8]

(c) Write short note - [6]

(i) Uniform grading

(ii) Gap grading

UNIT- II

- Q.2 (a) Describe the modified dump test for measuring the rheology of fresh concrete. [8]
- (b) What is the principle of half-cell potential meter? [4]
- (c) Differentiate between segregation and bleeding. [4]

OR

- Q.2 (a) Describe the phenomenon of micro cracking of hardened concrete. [8]
- (b) What is non – destructive testing of insitu fresh and hardened concretes? Discuss the pulse velocity method. [8]

UNIT- III

- Q.3 Differentiate between- [8]
- (a) (i) Weigh batching and volume batching.
- (ii) Tamping and rodding method of compaction.
- (b) (i) Discuss briefly slip moving form work. [4]
- (ii) Discuss the method of compaction. [4]

OR

- Q.3 (a) What is the effect of vibration on the strength and durability of concrete? Explain different types of vibrators. [8]
- (b) Write short notes on - [8]
- (i) Maturity of concrete
- (ii) Effect of delay in placing

UNIT- IV

- Q.4 (a) Explain the action and application of water reducing admixtures. [8]
- (b) Write a short note - [8]
- (i) Use of silica fume in concrete
- (ii) Superplasticizers

OR

- Q.4 What are the air entraining admixtures? How they affect water cement ratio, segregation and bleeding and permeability of concrete. [16]

UNIT- V

- Q.5 (a) What do you understand by sulphate resisting concrete? [4]
- (b) Enlist the test method for self – compacting. Describe the slump flow and T₅₀₀ list. [8]
- (c) What are the requirements of good staircase? [4]

OR

- Q.5 (a) What is self - compacting concrete and what are the advantages and disadvantages of using it? [8]
- (b) Write short notes - [8]
- (i) Application of High performance concrete.
- (ii) Durability performance grads.
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4E1211

Roll No. _____

Total No of Pages: 3

4E1211

B. Tech. IV - Sem. (Main) Exam., May - 2019

PCC Civil Engineering

4CE4-08 Concrete Technology

Time: 2 Hours

Maximum Marks: 120

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of seven questions from Part B and four questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

*Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*

1. NIL _____

2. NIL _____

PART – A

(Answer should be given up to 25 words only)

[10×2=20]

All questions are compulsory

- Q.1 Explain Design Mix and Nominal Mix.
- Q.2 List the factors affecting workability of Concrete.
- Q.3 Describe heat of hydration with various reactions.
- Q.4 How would you classify aggregates based on size and shape?
- Q.5 Explain requirements of good formwork.
- Q.6 Describe factors affecting permeability of concrete.

- Q.7 Discuss bleeding of concrete and factors affecting it.
- Q.8 What do you understand by “Initial Curing” and “Final Curing”.
- Q.9 Explain Durability in Concrete and factors affecting durability of concrete.
- Q.10 Describe role of admixtures in concrete.

PART – B

(Analytical/Problem solving questions)

[5×8=40]

Attempt any five questions

- Q.1 Describe Batching, mixing and Transportation of Concrete.
- Q.2 Differentiate between Retarder and Accelerator and write their applications. Describe air entraining admixtures in detail.
- Q.3 Discuss causes of deterioration of concrete.
- Q.4 Describe advantages of use of flyash in concrete and precautions while its use in concrete. Also explain the properties of flyash.
- Q.5 What do you mean by workability of concrete and explain the factors which affect workability? How will you determine workability by slump test?
- Q.6 Explain any four IS testing procedure for coarse aggregate.
- Q.7 Describe various types of superplasticizers, their chemical composition, difference and their effect in concrete.

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PART – C

(Descriptive/Analytical/Problem Solving/Design Questions) [4×15=60]

Attempt any four questions

- Q.1 Design concrete mix of grade of M25 by I.S method using ordinary Portland cement of 43 grade fine aggregate conforming to zone II, assuming quality control as good, take sp gravity of aggregate and coarse aggregate 3.15 & 2.85 respectively. Use maximum size of aggregate as 20mm. Assume suitable data wherever necessary.
- Q.2 Explain with neat sketch requirements for good formwork for columns and its foundation.
- Q.3 Describe Self Compacting Concrete and its various properties.
- Q.4 Explain Half Cell Potentiometer with neat sketch.
- Q.5 Explain salient features of sulfate resisting concrete and its various applications.
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3E1102

Roll No. _____

Total No of Pages: **3****3E1102****B. Tech. IV - Sem. (Main) Exam., May - 2019****HSMC****Technical Communication****All branches****Time: 2 Hours****Maximum Marks: 80***Instructions to Candidates:*

Attempt all five questions from Part A, four questions out of six questions from Part B and two questions out of three from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

*Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*

1. NIL2. NIL**PART – A****(Answer should be given up to 25 words only)****[5×2=10]****All questions are compulsory**

Q.1 Define Technical Communication.

Q.2 What do you understand by print media?

Q.3 Name various forms of technical discourse.

Q.4 Distinguish between technical proposal and technical report.

Q.5 Mention various kinds of technical documents.

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PART – B

(Analytical/Problem solving questions)

[4×10=40]

Attempt any four questions

Q.1 Discuss the importance and characteristics of technical communication. [5+5=10]

Q.2 Discuss the barriers to effective speaking.

Q.3 Describe the techniques to interpret and summarize technical texts.

Q.4 Spot the error and correct the following sentences: [10×1=10]

- (a) We have received no information.
- (b) I and he are brothers.
- (c) I have no any friends.
- (d) We should not make noise.
- (e) He has finished his letter last night.
- (f) If I were rich I will help you.
- (g) She came yesterday, doesn't she?
- (h) The last bus had gone until we had to walk home.
- (i) Will you male this letter immediately?
- (j) A person who can neither read or write is illiterate.

Q.5 Draft an official email informing about the forthcoming meeting of your company regarding improving work atmosphere in the company. [10]

Q.6 Explain the importance and types of technical articles. [4+6=10]

PART – C

(Descriptive/Analytical/Problem Solving/Design Question) [2×15=30]

Attempt any two questions

Q.1 Describe four basic technical communication skills and how to develop these four essential skills of technical communication? [8+7=15]

Q.2 Imagine yourself as Mehul Kumar of Kanpur, write a job application with resume in response to the advertisement for the post of Technical Executive in Tata Motors Ltd. Andheri East, Mumbai. [7+8=15]

Q.3 Discuss the kinds of Technical Proposals. Draft the format of technical proposal. [8+7=15]

4E4116

Roll No. _____

Total No of Pages: 3

4E4116

B.Tech. IV-Sem (Back) May 2019

Civil Engineering

4CE6A Quantity Surveying & Valuation

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks: 26

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/calculated must be stated clearly.

*Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*

1. NIL

2. NIL

UNIT -I

Q.1 Discuss the importance of quantity survey and valuation techniques in civil construction Projects [16]

OR

- Q.1 (a) What do you mean by 'Supplementary Estimates'? Explain the circumstances under which estimates are prepared. [8]
- (b) Describe various factors that influence the accuracy of estimates of building construction project. [8]

UNIT -II

- Q.2 (a) Write the purpose of rate analysis [6]
- (b) Analyze the rate of 12mm thick 1 : 4 cement and local sand mortar plaster on brick wall including material, labour T and P, watering etc. [10]

OR

- Q.2 (a) Prepare detailed rate analysis for providing and laying brick masonry work for 230mm thick wall using 1 : 4 (Cement : Sand) mortar in foundation and plinth. [8]
- (b) Prepare schedule of bar for R.C.C beam of size 230 × 450 × 3000mm from given details:

Type	Size b × d	Top bars	Bottom bar	Bent up bar	Stirrups
GB	230 × 450mm	2nos.10mm diameter Tor bar	2nos.12mm diameter Tor bars	1nos 16mm diameter Tor bars	6 diameter 120mmc/c

GB: Ground Beam

[8]

UNIT -III

- Q.3 Calculate the quantity of earth work for portion of a road from the following data
Formation width of road = 10m [16]
Side slope = 2:1
Assume there is no transverse slope
Use prismoidal formula

Distance in M	0	100	200	300	400	500	600
R.L of ground	114.50	114.75	115.25	115.20	116.10	116.85	118
R.L. of formation	115	Upward gradient 1 : 200					

OR

- Q.3 (a) What is the function of administrative approval, expenditure sanction and technical sanction in a project? [8]
- (b) Explain: (a) Tool and Plant provision (b) Departmental charges (c) Floor area [8]

UNIT -IV

- Q.4 (a) List various items of water supply and sanitary fittings in residential building [8]

- (b) State and explain factors affecting cost of work.

[8]

OR

- Q.4 (a) Differentiate between ordinary cash book and subsidiary cash book. What certificate is required to be given at the time of closing of a cashbook? [10]
- (b) Explain with example the procedure for working out the cost of materials at site [6]

UNIT - V

- Q.5 (a) Write down the purpose of valuation and major types of outgoings. [8]
- (b) Explain year's purchase and sinking fund. [8]

OR

- Q.5 (a) What do you mean by depreciation? Explain four major methods of calculating depreciation. [8]
- (b) The owner of a property gets a net annual income of Rs 40,500/- that he invests at 6% interest. At the end of 13 years he carries out certain repairs at the cost of Rs 1,22,000/-. He then gets an offer from a buyer to purchase the property for Rs 6,00,000/-. Determine who is at advantage owner or buyer? [8]
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4E1206

Roll No. _____

Total No of Pages: 3

4E1206

B. Tech. IV - Sem. (Main) Exam., May - 2019

BSC Civil Engineering

4CE2 – 01 Advanced Engineering Mathematics - II

AG, CE, MI

Time: 2 Hours

Maximum Marks: 80

Instructions to Candidates:

Attempt all five questions from Part A, four questions out of six questions from Part B and two questions out of three from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

*Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)*

1. NIL

2. NIL

PART – A

(Answer should be given up to 25 words only)

[5×2=10]

All questions are compulsory

- Q.1 Define line of regression and also write equations of line of regression. [2]
- Q.2 State addition law of probability. [2]
- Q.3 Find the value of k so that $f(x) = k \cdot x (2 - x)$ may be a probability density function of a random variable x for $0 \leq x \leq 2$. [2]
- Q.4 Define correlation. Also write Karl Pearson's coefficient of correlation and Spearman's rank correlation. [2]
- Q.5 If x is the number of points rolled with a balanced die. Find the expected value of –

$$G(x) = 2x^2 + 1$$

[2]

PART – B

(Analytical/Problem solving questions)

[4×10=40]

Attempt any four questions

Q.1 Obtain the rank correlation for the following data -

[10]

x	68	64	75	50	64	80	75	40	55	64
y	62	68	68	45	81	60	68	48	50	70

Q.2 If the coefficient of correlation between two variables x and y is 0.5 and the acute angle between their lines of regression is $\tan^{-1}\left(\frac{3}{5}\right)$, show that $\sigma_x = \frac{1}{2}\sigma_y$

[10]

Q.3 Find the coefficient of correlation and regression lines to the following data –

[10]

x	5	7	8	10	11	13	16
y	33	30	28	20	18	16	9

Q.4 Employ the method of least square to fit a parabola $y = a + bx + cx^2$ in the following data –

[10]

(x, y) : (-1, 2) (0, 0) (0, 1) (1, 2)

Q.5 A and B take turns in throwing of two dice, the first to throw 9 will be awarded prize. If

A has first turn, show that their chances of winning are in the ratio 9 : 8.

[10]

Q.6 Fit a Poisson distribution to the set of observations -

[10]

x	0	1	2	3	4
y	122	60	15	2	1

PART – C

(Descriptive/Analytical/Problem Solving/Design Questions) [2×15=30]

Attempt any two questions

Q.1 Two balls are selected at random from a box containing two red, three white and four blue balls. Let (x, y) be a bivariable random where x and y denote the number of red and white balls chosen – [15]

- (i) Find joint probability mass function of (x, y)
- (ii) Find marginal probability mass function of x and y .
- (iii) Conditional distribution of x given $y = 1$

Q.2 State and prove Bayes' theorem. [15]

Q.3 (i) Find the mean and variance of Binomial distribution. [7]

- (ii) A coin is tossed 900 times and head appeared 490 times. Would you conclude that the coin is a biased one? [8]
