

4E1302

Roll No. _____

Total No. of Pages: **4****4E1302****B. Tech. IV - Sem. (Main) Exam., - 2022****Computer Science & Engineering (AI)****4CAI1 – 03 Managerial Economics and Financial Accounting
All Branches****Time: 3 Hours****Maximum Marks: 70***Instructions to Candidates:*

Attempt all ten questions from Part A. Five questions out of seven questions from Part B and three 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. NIL2. NIL**PART – A****(Answer should be given up to 25 words only)****[10×2=20]****All questions are compulsory**

- Q.1 “Managerial economic supports manager to take decision for successful implementation of economic strategies.” Comment upon this statement.
- Q.2 Define GDP and NNP concepts of national income.
- Q.3 What is meant by price elasticity?
- Q.4 Elaborate the term circular flow of economy. Who are the main players involve in the circular flow of economy?

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- 5 What are the basic elements of demand and supply?
- 5 Write the concept of opportunity cost with one example.
- 7 Define Kinked demand curve and write one reason of price rigidity.
- 8 Differentiate between deductive and inductive methods of economics.
- 9 Discuss any two significant uses of cash flow statement.
- 10 What is meant by debt, liabilities and current assets in accounting?

PART – B

(Analytical/Problem solving questions)

[5×4=20]

Attempt any five questions (Word limit 100)

- 1 Define the concept of managerial economics. What are the micro and macro scopes of economics? Explain all in brief.
- 2 What is Law of demand? Draw the suitable diagram of demand curve and write its determinants.
- 3 Elaborate the cost and output relations in short run and long run. What is the role of Marginal cost in decisions?
- 4 How demand forecasting is useful for future decision making? Explain any two methods of demand forecasting.

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Q.5 Write the stages of production function. How manager can control the inputs in production?

Define your answer with suitable table of inputs and diagram.

Q.6 How price, output and profit can be determined in perfect competition? Draw suitable diagram.

Q.7 Sttelio Ltd. presents the following information and you are required to calculate funds from operations –

Profit and Loss Account

	₹		₹
To Operation Expenses	1,00,000	By Gross Profit	2,00,000
To Depreciation	40,000	By Gain on Sale of Plant	20,000
To Loss on sale of Building	10,000		
To Advertising Suspense Account	5,000		
To Discount Allowed	500		
To Discount on issue of Shares written off	500		
To Goodwill written off	12,000		
To Net Profit	52,000		
	2,20,000		2,20,000

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PART – C

(Descriptive/Analytical/Problem Solving/Design Questions) [3×10=30]

Attempt any three questions

- Q.1 Define circular flow of economy with suitable diagram. Which are the current economic problems are facing by nation after pandemic situation (Year 2020 - 2021)?
- Q.2 Define the term demand elasticity. What are the various degrees of elasticity? Define each with diagram and example.
- Q.3 What is meant by least cost combinations in production function? Elaborate the properties of least cost combinations.
- Q.4 Why price is rigid in market? Give reasons. Draw Kinked demand curve and how price and output can be determined under Kinked demand curve.
- Q.5 Differentiate between –
- (a) Demand curve and Supply curve
 - (b) Explicit cost and implicit cost
 - (c) Static economy and Dynamic economy
 - (d) Monopoly market and Monopolistic market
 - (e) Cash flow statement and Fund flow statement.
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4E1303

Roll No. _____

Total No. of Pages: 3

4E1303**B. Tech. IV - Sem. (Main) Exam., - 2022
Computer Science & Engineering (AI)
4CAI1 – 02 Technical Communication
All Branches****Time: 3 Hours****Maximum Marks: 70***Instructions to Candidates:**Attempt all ten questions from Part A. Five questions out of seven questions from Part B and three 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. NIL2. NIL**PART – A****(Answer should be given up to 25 words only)****[10×2=20]****All questions are compulsory**

- Q.1 What is technical communication?
- Q.2 Write the forms and aspects of 'Technical communication'?
- Q.3 What is the process of technical writing?
- Q.4 Define note-making.
- Q.5 What are the different discourse markers that can be used?
- Q.6 What are the different types of resumes?

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Q.7 Combine the following sentence using an appropriate form of the verb given in the brackets.

- (a) Man and woman.....complementary to each other. (is/are)
- (b) The leader as well as his brothers.....to the same tribe. (belong/belongs)

Q.8 Mention the characteristics of the Report.

Q.9 Find the errors in the following –

- (a) She can to drive.
- (b) The house isn't enough big

Q.10 Write short on the following –

- (a) Conference paper
- (b) Journal

PART – B

(Analytical/Problem solving questions)

[5×4=20]

Attempt any five questions (Word limit 100)

Q.1 “The more you read, the more you become efficient in speaking a language.” Throw light on the connection of reading and speaking and tell how you can develop effective speaking skills.

Q.2 Write in detail about the aspects of technical communication and throw light on the 7C's of effective technical communication.

Q.3 Write about the challenges in the process of technical communication in detail.

Q.4 Elaborate editing strategies to achieve appropriate technical style.

Q.5 Define technical communication and its importance in the life of an engineering professional.

Q.6 Elucidate the structure and format of technical articles.

Q.7 Write notes on the following –

- (a) Features of a report
- (b) Sales Letter

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PART – C

(Descriptive/Analytical/Problem Solving/Design Questions) [3×10=30]

Attempt any three questions

- Q.1 Create an email informing a group of people in the workplace about a co-worker of theirs whose management position has been downgraded to a staff position. Be clear, direct and concise in your delivery of the information and your explanation for it. Take into account workplace morale and the ethics of this decision. Your email should be at least 150 words long.
- Q.2 Your workplace is deciding how to upgrade the desktop computer systems. Prepare a report comparing three types of brands. Identify what categories you would use to compare all three. Include what graphics might be necessary for this report. Include your final recommendation at the end of the analysis.
- Q.3 Write a job application in response to the advertisement for various faculty positions in June 2019 issue of the Hindustan Times to apply for the post of Assistant Professor in Computer Science. Write a detailed resume to be enclosed with it.
- Q.4 (a) Discuss the various elements of a formal report.
(b) Write brief notes on the following –
(i) Significance of reports.
(ii) Formal and non-formal reports.
- Q.5 With the advancement of technology, technical communication has also evolved and many unethical practices have been adopted by the professionals with a huge loss of reputation and assets. Throw light on the role of ethics and moral values in generating, analyzing and communication of technical information.
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4E1313

Roll No. _____

Total No. of Pages: 4

4E1313
B. Tech. IV - Sem. (Main) Exam., - 2022
Civil Engineering
4CE2 – 01 Advance Engineering Mathematics - II
AG, CE, MI

Time: 3 Hours

Maximum Marks: 70

Instructions to Candidates:

Attempt all ten questions from Part A. Five questions out of seven questions from Part B and three 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. NIL2. NIL**PART – A****(Answer should be given up to 25 words only)****[10×2=20]****All questions are compulsory**

- Q.1 A card is drawn from a well – shuffled pack of playing cards. What is the probability that it is either a spade or an ace?
- Q.2 When A and B are two mutually exclusive events such that $P(A) = 1/2$ and $P(B) = 1/3$, find $P(A \cup B)$ and $P(A \cap B)$.
- Q.3 If X and Y are two random variables such that $E(X) = 3$ and $E(Y) = 5$, then what will be the value of $E(2X + 4Y)$?

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- Q.4 Write the Chebyshev's Inequality.
- Q.5 If mean of Poisson distribution is 3, then what is the value of variance?
- Q.6 What type of correlation exists when the values of two variables move in the same direction?
- Q.7 If $r = 0.8$ and $b_{xy} = 0.32$, then what will be the value of b_{yx} ?
- Q.8 If $y = 2x + 10$ is the best fit for 10 pairs of values (x, y) , by least square method and $\sum y = 200$; then find the value of $\sum x$.
- Q.9 Which distribution is useful for large sample while testing for population means?
- Q.10 What is the meaning of the testing of the hypothesis?

PART – B

(Analytical/Problem solving questions)

[5×4=20]

Attempt any five questions (Word limit 100)

- 1 In a bolt factory machines A, B and C manufactures respectively 25%, 35% and 40% of the total. Of their output 5, 4, 2 percentages are defective bolts. A bolt is drawn at random from the product and is found to be defective. What is the chance that it was manufactured by machine C?
- 2 A continuous random variable has the probability density function $f(x) = kx^2e^{-x}$, $x \geq 0$. Find its second moment about mean.
- 3 A perfect cubical die is thrown a large number of times in sets of 8. The occurrence of 5 and 6 is called a success. In which proportion of the sets you expect 3 successes.
- 4 If $P(X = 2) = 9P(X = 4) + 90P(X = 6)$ in the Poisson distribution then find its mean, variance and standard deviation.

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Q.5 Fit a second degree parabola to the following -

x	0	1	2	3	4
y	1	1.8	1.3	2.5	6.3

Q.6 Two random variables have the following regression lines: $3x + 2y - 26 = 0$ and $6x + y - 31 = 0$. Find the mean values and coefficient of correlation between x and y.

Q.7 A coin is tossed 400 times and it turns up head 216 times. Discuss whether the coin may be unbiased one.

PART - C

(Descriptive/Analytical/Problem Solving/Design Questions) [3×10=30]

Attempt any three questions

Q.1 Let X and Y be continuous random variables having joint density function -

$$f(x, y) = \begin{cases} c(x^2 + y^2), & 0 < x < 1, 0 < y < 1 \\ 0, & \text{otherwise} \end{cases}$$

Determine -

- (a) constant c,
- (b) $P\left(X < \frac{1}{2}, Y > \frac{1}{2}\right), P\left(\frac{1}{4} < X < \frac{3}{4}\right), P\left(Y < \frac{1}{2}\right)$
- (c) marginal density functions of X and Y
- (d) whether X and Y are independent
- (e) conditional distribution of X and Y

Q.2 Determine the binomial distribution's moment generating function and, as a consequence, its mean and variance.

Q1

Q.3 If the skulls are classified as A, B and C according as the length – breadth index is under 75, between 75 and 80, or over 80. Using normal distribution find approximately the mean and standard deviation of a series in which A are 58%, B are 38% and C are 4%, being given that –

$$f(t) = \frac{1}{\sqrt{2\pi}} \int_0^t \exp(-x^2/2) dx,$$

then $f(0.20) = 0.08$ and $f(1.75) = 0.46$.

Q.4 Calculate rank correlation coefficient for the following data -

x	81	78	73	73	69	68	62	58
y	10	12	18	18	18	22	20	24

Q.5 In a year there are 956 births in a town A, of which 52.5% were males, which in town A and B combined, this proportion in a town of 1,406 births was 0.496. Is there any significant difference in the proportion of male births in the two towns?

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4E1314

Roll No. _____

Total No. of Pages: **3****4E1314****B. Tech. IV - Sem. (Main) Exam., - 2022****Civil Engineering****4CE3 – 04 Basic Electronics for Civil Engineering Applications****Time: 3 Hours****Maximum Marks: 70***Instructions to Candidates:**Attempt all ten questions from Part A. Five questions out of seven questions from Part B and three 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. NIL2. NIL**PART – A****(Answer should be given up to 25 words only)****[10×2=20]****All questions are compulsory**

Q.1 What is the significance of the number system?

Q.2 The binary number 10101 is equivalent to decimal number.....

Q.3 State DeMorgan's theorem.

Q.4 What are the selection criteria for the transducer?

Q.5 Decimal 43 in hexadecimal, and BCD number system is respectively and

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- Q.6 What are the selection criteria for the transducer?
- Q.7 What are the atmospheric errors in the sensors?
- Q.8 How many types of resolutions are in remote sensing?
- Q.9 What causes radiometric distortion?
- Q.10 How do you calculate FOV from IFOV?

PART – B

(Analytical/Problem solving questions)

[5×4=20]

Attempt any five questions (Word limit 100)

- Q.1 How a PN junction diode is working? Draw and explain the V-I characteristics of PN diode with neat diagrams.
- Q.2 Explain in detail about classifications of the transducer.
- Q.3 Differentiate the following in brief -
- (a) Gross errors and systematic errors
 - (b) Absolute and relative errors
 - (c) Accuracy and precision
- Q.4 Draw and explain the capacitive transducer in detail. Also, mention its applications.
- Q.5 Discuss the following in brief -
- (a) Control surveys using GNSS
 - (b) Total station and traversing methods
- Q.6 Draw and explain the resistive transducer in detail.
- Q.7 Draw and explain the working of piezoelectric sensors/transducers.

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PART – C

(Descriptive/Analytical/Problem Solving/Design Questions)

[3×10=30]

Attempt any three questions

- Q.1 What is data acquisition? Explain in detail about ADC & DAC.
- Q.2 Explain the construction and working of BJT. Discuss the CE configuration with the help of input and output characteristics.
- Q.3 Write a short note on applications of optical and microwave remote sensing techniques for Civil Engineering.
- Q.4 Discuss the following steps of Digital Image Processing in detail –
- (a) Pre-processing
 - (b) Enhancement
 - (c) Classification
 - (d) Accuracy assessment
- Q.5 Draw and explain the following using a truth table and logic diagrams –
- (a) J-K Flip - Flop
 - (b) R-S Flip - Flop
-

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Total No. of Pages: 4

4E1315

B. Tech. IV - Sem. (Main) Exam., - 2022

Civil Engineering

4CE4-05 Strength of Materials

Time: 3 Hours

Maximum Marks: 70

Instructions to Candidates:

Attempt all ten questions from Part A. Five questions out of seven questions from Part B and three 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 Draw a neat diagram of fixed support. What type of support reactions are available at a fixed support?
- Q.2 Write short notes on 'Slenderness Ratio'.
- Q.3 State Hooke's law. Write down different types of stresses and strains.
- Q.4 Why a hollow shaft is preferred over a solid shaft?

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5. Define the following terms: Thermal Stresses, Thermal Strains and Poisson's ratio.
6. Define 'point of contraflexure'.
7. Define principal planes and principal stresses and explain their uses.
8. What do you understand by principle of super position?
9. Define angle of twist, twisting moment and torsional rigidity.
10. Which is the effective method for finding out the deflection & why?

PART – B

(Analytical/Problem solving questions)

[5×4=20]

Attempt any five questions (Word limit 100)

1. A rectangular beam 200 mm wide and 300 mm deep carries an UDL of 10 kN/m over a simply supported span of 6 m. Determine:

- (i) The maximum stress in the beam due to bending
- (ii) The radius of curvature for the section where bending is maximum, if $E = 200 \text{ GPa}$

2. Write the assumption of theory of simple bending and prove this relation.

$$\frac{M}{I} = \frac{\sigma}{y} = \frac{E}{R}$$

3. Derive the relation between load, shear force and bending moment.
4. Find the maximum torque that can be safely applied to a shaft of 200 mm dia, if permissible angle of twist is 1° in a length of 5 m and the permissible shear stress is 45 N/mm^2 . Take modulus of rigidity $(G) = 0.8 \times 10^5 \text{ N/mm}^2$.
5. Derive an expression of the Euler's crippling load for a long column, when -
 - (i) It has both ends hinged and
 - (ii) Both the ends are fixed

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- Q.6 Draw the typical shape of shear stress distribution for the following sections shown in Fig. 1:

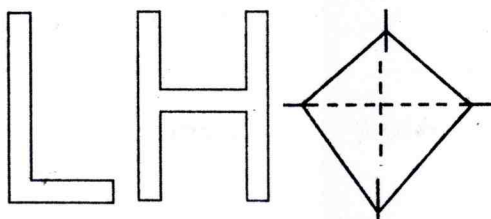


Fig 1

- Q.7 An aluminum rod 22 mm diameter passes through a steel tube of 25 mm internal diameter and 3 mm thick. The rod and tube are fixed at a temperature 180° C. Find the stress in the rod and tube, when the temperature falls to 60° C.

Take $E_s = 200 \text{ kN/mm}^2$; $E_A = 70 \text{ kN/mm}^2$; $\alpha_s = 12 \times 10^{-6} / ^\circ \text{C}$; $\alpha_A = 12 \times 10^{-6} / ^\circ \text{C}$

PART – C

(Descriptive/Analytical/Problem Solving/Design Questions) [3×10=30]

Attempt any three questions

- Q.1 A simply supported beam of rectangular cross section of dimension 150×300 mm is having span of 4.5 m. It is loaded with u.d.l. of 8 KN-m compute:
- Shear stress developed on a layer 60 mm above the natural axis of a section located at 1.5 m from the left support.
 - Maximum shear stress on the support at neutral axis.
- Q.2 What do you understand by principal stresses and principal planes? Derive the expression to obtain principle stresses under the action of two perpendicular direct stresses with state of simple shear applied to an elastic material at a certain point.
- Q.3 A steel bar of rectangular cross section 30 x 40 mm pinned at each end is subjected to an axial compressive load. The bar is 1.75 m long. Determine the buckling load and corresponding stress using Euler's formula. Take $E = 200 \text{ GPa}$.

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- Q.4 Draw the bending moment and shear force distribution diagrams for the beam shown in fig. 2. Indicate the values of S.F. and B.M at all critical locations. Also give the value of maximum shear force and maximum +Ve and -Ve bending moments and their locations. Determine the points of contraflexure.

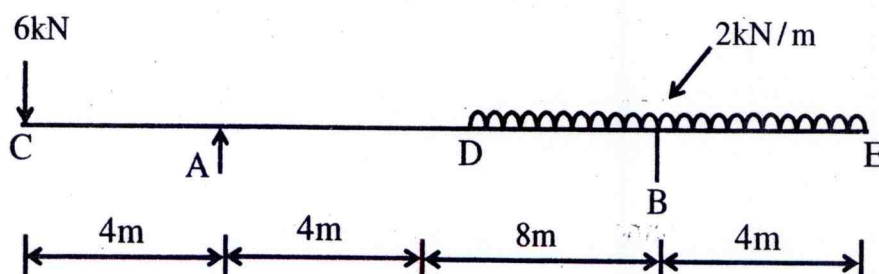


Fig.2

- Q.5 A beam AB of 9 m span is simply supported at the ends and is loaded as shown in fig. 3.

Determine-

- Deflection at C
- Maximum deflection and
- Slope at end A

Take $E = 2 \times 10^5 \text{ N/mm}^2$ and $I = 2 \times 10^7 \text{ mm}^4$.

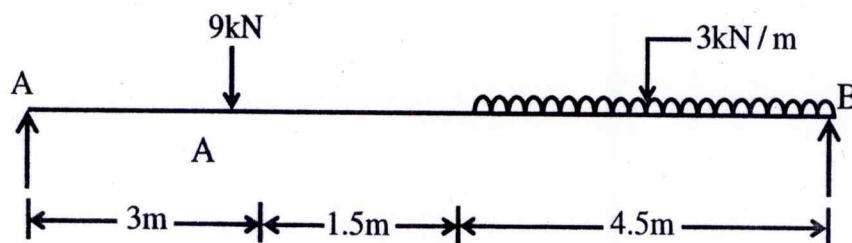


Fig.3

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Total No. of Pages: 3

4E1316

B. Tech. IV - Sem. (Main) Exam., - 2022

Civil Engineering

4CE4 - 06 Hydraulics Engineering

Time: 3 Hours

Maximum Marks: 70

Instructions to Candidates:

Attempt all ten questions from Part A. Five questions out of seven questions from Part B and three 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 Define geometric similarity and kinematic similarity.
Q.2 What is the difference between laminar flow and turbulent flow?
Q.3 Define hydraulic jump.
Q.4 Define hydraulic efficiency and mechanical efficiency of a turbine.
Q.5 What is aquifers?
Q.6 What is the purpose of the draft tube?
Q.7 What is silt excluders?

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- Q.8 Define unit hydrograph.
Q.9 Write down different types of rain gauge.
Q.10 Define hydrologic cycle.

PART – B

(Analytical/Problem solving questions)

[5×4=20]

Attempt any five questions (Word limit 100)

- Q.1 Derive equation for velocity distribution for turbulent flow in pipes.
- Q.2 A rectangular channel of width, 4m is having a bed slope of 1 in 1500. Find the maximum discharge through the channel. Take value of $C = 50$.
- Q.3 Describe main parts of a centrifugal pump.
- Q.4 What do you mean by run-off? Discuss different factors affecting run-off.
- Q.5 Write a short notes on the following –
- (A) Estimation of channel losses
 - (B) Silt control in canals
- Q.6 Find the slope of the free water surface in a rectangular channel of width 20m, having depth of flow 5 m. The discharge through the channel is $50\text{m}^3/\text{s}$. The bed of the channel is having a slope of 1 in 4000. Take the value of Chezy's constant $c = 60$.
- Q.7 A nozzle of 50mm diameter delivers a stream of water at 20m/sec perpendicular to a plate that moves away from the jet at 5m/s.
- Find –
- (i) The force on the plate
 - (ii) The work done
 - (iii) The efficiency of jet

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PART – C**(Descriptive/Analytical/Problem Solving/Design Questions)** [3×10=30]**Attempt any three questions**

Q.1 Using Buckingham's π theorem, show that the velocity through a circular orifice is given

$$\text{by } V = \sqrt{2gh} \phi \left[\frac{D}{H}, \frac{\mu}{\rho g H} \right],$$

Where H is the head causing flow, D is the diameter of the orifice, μ is the co-efficient of viscosity, ρ is the mass density and g is the acceleration due to gravity.

Q.2 Derive conditions for most economical trapezoidal channel section.

Q.3 A 4m wide rectangular channel conveys $20\text{m}^3/\text{sec}$ of water with a velocity of 5m/s . Check is there a condition for hydraulic jump to occur. If the hydraulic jump takes place in down stream side, find the depth of flow after the jump.

Q.4 Describe briefly the function of various main component of Pelton turbine with neat sketches.

Q.5 Describe various type of rain gauges for the measurement of rainfall with simple sketches.

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Roll No. _____

Total No. of Pages: 2

4E1317

B. Tech. IV - Sem. (Main) Exam., - 2022

Civil Engineering

4CE4 – 07 Building Planning

Time: 3 Hours

Maximum Marks: 70

*Instructions to Candidates:**Attempt all ten questions from Part A. Five questions out of seven questions from Part B and three 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. NIL2. NIL**PART – A****(Answer should be given up to 25 words only)****[10×2=20]****All questions are compulsory**

- Q.1 What are the climatic zones of India?
- Q.2 Explain about plinth regulation.
- Q.3 What are the objectives of building planning?
- Q.4 Write down about noise control.
- Q.5 What are the louvers?
- Q.6 What do you understand by terms aspect & prospect?
- Q.7 Write about sun shading devices.

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- Q.8 What is thermal comfort?
- Q.9 Explain the term global climate.
- Q.10 What do you understand by floor area ratio?

PART – B

(Analytical/Problem solving questions)

[5×4=20]

Attempt any five questions (Word limit 100)

- Q.1 Discuss factors to be considered in “Vastu”. Design a residential building on a plot of 15m×25m as per Vastu.
- Q.2 Discuss the requirements of good lighting system in a building.
- Q.3 Write a short note on firefighting provision.
- Q.4 Discuss the functional requirements of a good ventilating system.
- Q.5 Discuss the criteria for thermal comfort. Explain uses of Bioclimatic chart.
- Q.6 What do you understand by Building By-laws?
- Q.7 Discuss various factors affecting orientation of building.

PART – C

(Descriptive/Analytical/Problem Solving/Design Questions)

[3×10=30]

Attempt any three questions

- Q.1 Discuss the different types of buildings in detail. Explain the criteria of site selection for a building.
- Q.2 Explain the term principles of planning. Discuss the various factors affecting the principles of planning.
- Q.3 Discuss in detail the acoustics and sound insulation of a building.
- Q.4 What is sun path diagram? Discuss any one method of drawing sun path diagram.
- Q.5 Discuss Roominess, Circulation, Flexibility and Privacy with respect to planning of a building.

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Roll No. _____

Total No. of Pages: 2

4E1318

B. Tech. IV - Sem. (Main) Exam., - 2022

Civil Engineering

4CE4 – 08 Concrete Technology

Time: 3 Hours

Maximum Marks: 70

Instructions to Candidates:

Attempt all ten questions from Part A. Five questions out of seven questions from Part B and three 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 List the Bogue's compounds present in cement with its composition.
- Q.2 Write about heat of hydration.
- Q.3 What is the purpose of adding an air entraining admixture to concrete?
- Q.4 Differentiate between Nominal Mix and Design Mix.
- Q.5 What is Batching in concrete?
- Q.6 Define Laitance.
- Q.7 Name any four properties of hardened concrete.
- Q.8 On what circumstances high grade concretes are utilize effectively?
- Q.9 What is the use of IS 383?
- Q.10 Name the admixture used for quick setting of concrete.

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PART – B

(Analytical/Problem solving questions)

[5×4=20]

Attempt any five questions (Word limit 100)

- Q.1 Explain initial and final setting time of cement.
- Q.2 What is curing of concrete and its significance?
- Q.3 Differentiate between accelerators and retarders.
- Q.4 Classify the aggregate and its important role in concrete.
- Q.5 Discuss the tests for workability of concrete.
- Q.6 Describe the durability of concrete.
- Q.7 Explain the effect of GGBFS on concrete properties.

PART – C

(Descriptive/Analytical/Problem Solving/Design Questions)

[3×10=30]

Attempt any three questions

- Q.1 Explain the hardening and strength gaining of cement.
- Q.2 Find the quantity of Cement, Coarse Aggregate and Fine Aggregate in Kg/m^3 by IS method for the following requirements:
 - (a) Characteristics compressive strength at 28 days: 25 N/mm^2
 - (b) Maximum nominal size of aggregate: 20 mm
 - (c) Shape of aggregate: angular
 - (d) Slump requirement: 50 mm
 - (e) Sand Zone -II
 - (f) Free Water Cement Ratio: 0.55(for mild exposure, Reinforced Concrete)
 - (g) Specific Gravity of cement = 3.15, Coarse aggregate = 2.7, and Fine aggregate= 2.6
 - (h) Water absorption of Coarse aggregate = 0.5%, Fine aggregate = 1%
- Q.3 How will you determine the compressive strength of cement? Explain briefly the procedure.
- Q.4 Write short note of any two NDT method.
- Q.5 What are Super Plasticizers? How are these helpful in modifying the properties of concrete?

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B. Tech. IV - Sem. (Back) Exam., - 2022

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**

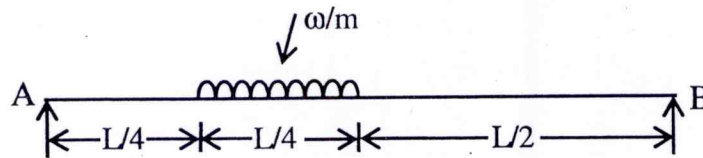
- Q.1 (a) Show that the deflection of a simply supported beam carrying point load at centre is $\frac{WL^3}{48EI}$. [6]
- (b) A beam of length 6 m and of uniform rectangular section is simply supported at its ends. It carries UDL of 19 kN/m over the entire span. Calculate the depth and width of the beam of permissible bending stress is 15 N/mm² and central deflection is not to exceed 1 cm. [10]

OR

- Q.1 (a) Derive the differential equation of a deflected beam as given $EI \frac{d^2y}{dx^2} = M$, where M is Bending moment, E is Young's modulus of elasticity and I is moment of inertia. [6]

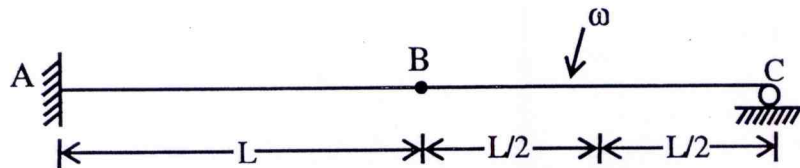
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- (b) A uniform beam of length L is simply supported at its ends and carries a UDL of ω per unit length between mid span and three quarter span as shown in figure. Obtain an expression for the deflection at mid span using Macaulay's method. [10]

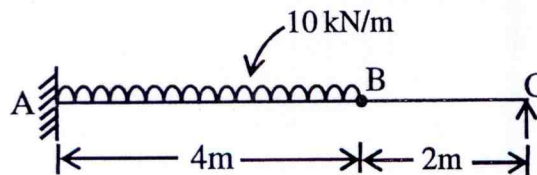


UNIT- II

- Q.2 (a) A beam ABC is fixed at end A and has a roller support at end C, it is also provided with an internal hinge at B as shown in figure. Determine the slope and deflection at the hinge B, when loaded with a point load ω as shown in figure below. $EI = \text{constant}$ [8]



- (b) Compute the reaction at the end C of the propped cantilever shown in figure. [8]

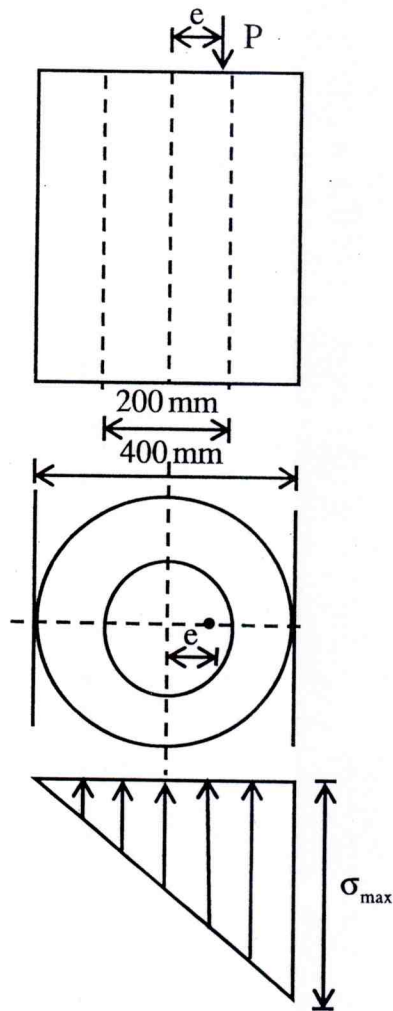


OR

- Q.2 (a) A simply supported beam of span 8 meters carries a uniformly distributed load of 24 kN/m run over the whole span. The beam is propped at the middle of the span. Find the amount by which the prop should yield in order to make all three reactions equal. Take $E = 200 \times 10^6 \text{ kN/m}^2$ and $I = 20 \times 10^{-5} \text{ m}^4$. [8]

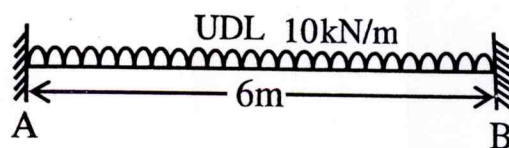
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- (b) A hollow rectangular column of external depth 1m and external width 0.8 m is 10 cm thick. Calculate the maximum and minimum stress in the section of the column if a vertical load of 200 kN is acting with an eccentricity of 15 cm as shown in figure. [8]



UNIT- III

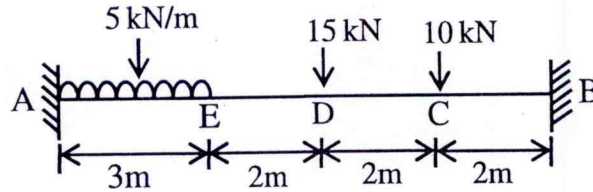
- Q.3 Analyze the fixed beam using moment area method EI is constant draw S.F.D and B.M.D. [16]



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OR

- Q.3 Determine the fixed end moments and plot the S.F. and B.M. diagram of the figure shown. [16]



UNIT- IV

- Q.4 (a) Derive the expression for shear stress produced in a circular shaft subjected to torsion. [6]
 (b) A circular steel shaft of 100 mm diameter and 1 m length is carrying a torsion of 12 kN/m. Determine the maximum shear stress and the rate of twisting in the shaft. [10]

OR

- Q.4 (a) Derive the relation for a solid circular shaft. [6]

$$\frac{T}{J} = \frac{Z_{\max}}{R} = \frac{N\theta}{L}$$

 (b) A laminated spring is 800 mm long and is made of twelve leaves of the same thickness 40 mm wide. Find the thickness of the leaves, if the bending stress is to be limited to 200 N/mm² and the spring is subjected to a point load of 6 kN at its centre. Also find the central deflection. Take $E = 2 \times 10^5$ N/mm². [10]

UNIT- V

- Q.5 (a) Derive an equation which gives the relationship between natural frequency and the static deflection of the system. [8]
 (b) Compute the stiffness of spring in the series and the parallel arrangements. [8]

OR

- Q.5 Write short note on the following -
 (a) Under, over and critical damping [4]
 (b) Types of vibration [4]
 (c) Rayleigh's method to derive the equation of motion of a vibratory system [4]
 (d) Vibration control in the design of structure [4]

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B. Tech. IV - Sem. (Back) Exam., - 2022

HSMC Aeronautical Engineering

4AN1-03/ Managerial Economics and Financial Accounting

Common for all branches

Time: 2 Hours

Maximum Marks: 80

Min. Passing Marks: 28

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 Circular flow of economic activity

Q.2 Demand forecasting

Q.3 Define marginal cost

Q.4 Oligopoly marker

Q.5 Capital budgeting

[3E1103]

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PART – B

(Analytical/Problem solving questions)

[4×10=40]

Attempt any four questions

- Q.1 What is Managerial Economic? What are the principles of Managerial Economic?
- Q.2 What is National Income and methods of measuring National Income?
- Q.3 What is Price Elasticity? Explain types of Price Elasticity of Demand.
- Q.4 Discuss the different cost concepts relevant to managerial decision for Planning and Control.
- Q.5 Describe the characteristics of Pure/Perfect Competition and Pure Monopoly.
- Q.6 What are Financial Ratios? Explain two Financial Ratios in detail.

PART – C

(Descriptive/Analytical/Problem Solving/Design Questions)

[2×15=30]

Attempt any two questions

- Q.1 What is Law Supply? What are the determinants of Supply? Explain four determinates in detail.
- Q.2 State and explain the law of variable proportions.
- Q.3 What is Financial Statement Analysis? What are the three basic tools for Financial Statement Analysis?
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