

FACULTY OF ENGINEERING**B.E. 3/4 (Civil) II – Semester (Old) Examination, May / June 2018****Subject: Water Resources Engineering & Management – I****Time: 3 Hours****Max.Marks: 75**

Note: Answer all questions from Part A & any five questions from Part B.
Assume data suitably wherever necessary.

PART – A (25 Marks)

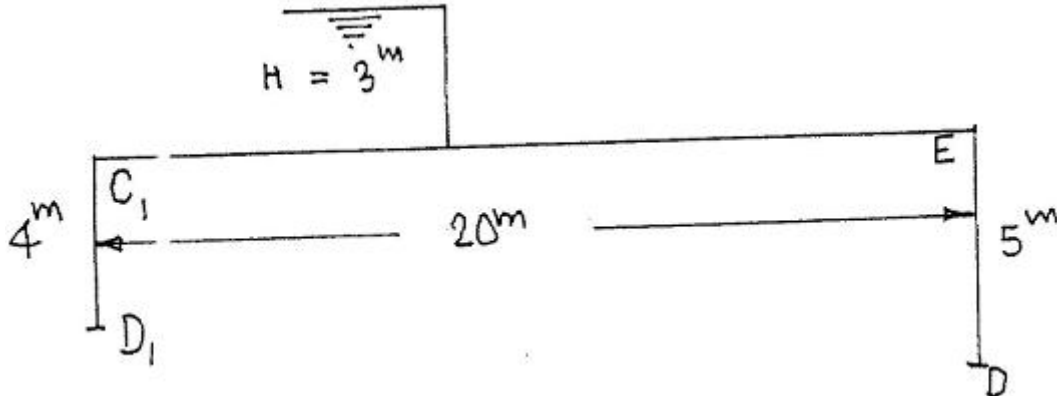
- 1 What is the special characteristic we derive from the data of a recording type of rain gauge, and how such data is useful in Hydrology? 3
- 2 Distinguish between a confined aquifer and unconfined aquifer. 2
- 3 List at least four Irrigation efficiencies at various tiers of an Irrigation system. 2
- 4 Water is drawn at head into a canal at a duty of 1000 ha/cumec, what would be the revised duty at which the canal is to be run if the canal loses 12% of its water in the first idle reach of two kilometres? 3
- 5 What 'Delta' would you consider appropriate for the crops of Paddy and Gingelly, if you are the designer of a contour canal? 3
- 6 Give the expression for relation between duty, delta and base period. 3
- 7 Under what hydraulic condition would you select a super passage? 2
- 8 Enumerate the advantage of providing a modular outlet in canal supervision. 2
- 9 What are the key parameters on which Water Resources Projects are evaluated? 2
- 10 State the express purpose for which a cross drainage work is provided. 3

PART – B (5x10 = 50 Marks)

- 11 a) Develop ordinates of a Unit Hydrograph for the following storm observed at a gauging site. The base flow is 8 cumecs. The catchment area is 10 sq. km. 5

Hours	6am	8am	10am	12noon	2pm	4pm
Discharge in Cumecs	8	40	140	60	30	8
- b) For what purpose do we use Isohyetal method? Draw a typical diagram of a catchment with Isohytes, and explain the steps sequentially for such a method? 1+4
- 12 a) What is the philosophy of Balanced Depth of cutting? Derive the expression for BDC. 1+4
- b) Compare Kennedy's and Lacey's theories. According to your understanding which one is more rational, and give your reasons for the same. 3+1+1

- 13 a) Explain the causes of failures of a diversion head work on permeable foundations and remedy for each such failure. 5
- b) Design the thickness of apron required at point 'E' for the following diversion work on a permeable foundation using Khosla's theory, unit weight $2t/\text{cu.m}$. Factor of Safety: 1.2. 5



- 14 a) Draw a schematic diagram for an aqueduct and explain the steps to design an Aqueduct. 5
- b) Design a trapezoidal notch type of fall for the following data 5
- Full supply discharge : 4 cumecs
 - Bed width : 6m
 - Full supply depth : 1.4m
 - Half Supply Depth : 1m
- 15 a) Draw a neat schematic diagram of a Warabandi system depicting all the tiers of distribution and explain in sequential steps how the system is implemented on the ground. 5
- b) Depict the key processes of a Hydrologic cycle on a schematic diagram and the importance of all such hydrological/hydraulic items in Civil Engineering. 5
- 16 Write short notes on
- a) Systematic canal operation 5
 - b) IWRM 5
- 17 a) Large sample of peak flood data reveals the following pattern of return periods. 5

Sl No	Return Periods in years	Peak flood
1	50	20,000
2	100	30,000

Estimate magnitude of flood for a return period of 200 years

- b) List and elaborate the factors that influence run-off. 5

FACULTY OF ENGINEERING

B.E. 3/4 (Civil) II-Semester (Main & Backlog) Examination, May 2018

Subject : Water Resources Engineering – I

Time : 3 hours

Max. Marks : 75

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (25 Marks)

- | | |
|---|---|
| 1 State the various components of hydrologic cycle. | 2 |
| 2 Differentiate between duty and delta. | 2 |
| 3 What are the advantages of lined canal? | 2 |
| 4 List the functions of cross regulator works. | 2 |
| 5 What is the purpose of cross drainage work? | 2 |
| 6 Define unit hydrograph. | 3 |
| 7 One cumec of water is pumped in to a farm distribution system 0.8 cumec is delivered – 10 a turnout 0.9 kilometers from well compute the conveyance efficiency. | 3 |
| 8 Define exit gradient and write its formula. | 3 |
| 9 Distinguish between head regulator and cross regulator. | 3 |
| 10 Distinguish between aqueduct and canal siphon. | 3 |

PART – B (50 Marks)

- | | |
|--|---|
| 11 a) Define specific yield, specific capacity and specific retension. | 5 |
| b) During recuperation test the water in an open well was depressed by 2m while pumping out and recuperated by 1.5m in 2 hours. Estimate yield from a well of 2m diameter under a depression head of 2m. | 5 |
| 12 a) Compare Kennedy's and Lacey's silt theories. | 5 |
| b) Design an irrigation canal to carry a discharge of 50m ³ /s by Kennedy's theory. Take slope of the channel as : 5000, sand critical velocity ratio as 1. Assume any other data suitably. | 5 |
| 13 a) Outline the steps involved in determining the floor thickness of a weir placed over permeable foundation. | 5 |
| b) Discuss briefly the causes of failure of weirs an permeable foundation and their remedies. | 5 |
| 14 a) Write a detailed note on canal escape. | 5 |
| b) Define the terms proportionality, sensitivity and flexibility of an outlet and derive the relation between sensitivity and flexibility. | 5 |
| 15 a) Distinguish between | |
| i) Inlet and level crossing | |
| ii) Super passage and canal siphon | 5 |
| b) Explain how the transitions in a siphon aqueduct are designed? | 5 |

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- 16 a) What is meant by balanced depth of cutting? Explain in brief. 5
b) Explain how head loss through a siphon is calculated. 5
- 17 Write short notes on Two of the following : 10
a) Water distribution systems
b) Sprinkler irrigation systems
c) Initial and final regime

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FACULTY OF ENGINEERING

**B.E. 3/4 (EE/Inst./ECE) II-Semester (Main & Backlog) Examination,
May / June 2018**

Subject : Managerial Economics and Accountancy

Time : 3 hours

Max. Marks : 75

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (25 Marks)

- | | |
|--|---|
| 1 Define evolution of Economics. | 2 |
| 2 Explain managerial economics. | 2 |
| 3 What is demand function? | 2 |
| 4 Firm and industry | 2 |
| 5 Fixed and variable cost | 2 |
| 6 What is the significance of Capital Management? | 3 |
| 7 What is going concern concept? | 3 |
| 8 What are the features of Monopoly? | 3 |
| 9 What is break-even point? | 3 |
| 10 Write journal entries for the following : | 3 |
| a) Krishna commenced business with cash Rs.10,00,000 | |
| b) Bought goods for cash Rs.10,000 | |
| c) Sold goods to Rajesh Rs.2,30,000 | |

PART – B (50 Marks)

- 11 Define Managerial Economics its usefulness to Engineers for decision making.
- 12 Explain the different methods of demand forecasting.
- 13 What is Economies of Scale?
- 14 From the following information find out.
a) P/V ratio b) B.E.P. c) Margin of safety d) Sales to earn a profit of Rs.6,000. Total fixed cost Rs.4,500 Total variable cost Rs.7,500 Total sales Rs.15,000.
- 15 From the following cash in flow find out the Net Present Value. Cost of Investment Rs.85 lakhs Rate of Return is 10%.

Cash in Flow	Year 1	Year 2	Year 3	Year 4
Rs.	40 lakhs	20 lakhs	30 lakhs	40 lakhs

- 16 Prepare a bank reconciliation statement as on 31-12-2016.
- a) Bank Balance as per pass book Rs.28,000
- b) Cheque deposited in bank on 28th December amounted to Rs.3,400 were not collected.
- c) Cheques amounting to Rs.4,000 issued before 27th December were not presented for payment.
- d) Interest on deposits Rs.80/- Dividend Rs.800/- credited by the bank were entered in the pass book only.
- e) Bank charges Rs.20/- Insurance Premium Rs.300/- were entered in pass book only.

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17 Prepare Trading and Profit and Loss account of Raj Traders as on 31st March 2015 and Balance Sheet as on that date :

Debit Balance	Amount Rs.	Credit Balance	Amount Rs.
Electricity	14,000	Interest Received	16,000
Land	1,40,000	Discount	6,000
Advertisement	16,000	Purchase	10,000
Wages	50,000	Returns	8,00,000
Opening stock	20,000	Sales	60,000
Rent	24,000	Creditors	3,02,000
Purchases	3,00,000	Capital	15,000
Office Expenses	30,000	Bills payable	
Buildings	4,00,000		
Salaries	90,000		
Power, gas and water	30,000		
Sales returns	20,000		
Furniture	15,000		
Debtors	60,000		
	12,09,000		12,09,000

Adjustments : a) Outstanding Salaries Rs.10,000
 b) Closing Stock Rs.80,000
 c) Depreciation on Building 10% per annum

FACULTY OF ENGINEERING

B.E. 3/4 (M/P) II-Semester (Main & Backlog) Examination, May / June 2018

Subject : Refrigeration and Air Conditioning

Time : 3 hours

Max. Marks : 75

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (25 Marks)

- 1 What are the application of Refrigeration?
- 2 What do you mean by a heat engine, refrigerator and heat pump?
- 3 Compare dry and wet compression processes.
- 4 What is the use of water cooler and flash chamber in VCR system?
- 5 What are the desirable properties of an absorbent used in VARS?
- 6 Explain seebeck Peltier and Thomson effects.
- 7 Define wet bulb temperature.
- 8 What are the factors affecting human comfort?
- 9 What is infiltrations air?
- 10 What is ESHF?

PART – B (50 Marks)

- | | |
|---|---|
| 11 a) List out methods of Refrigeration. | 3 |
| b) An air refrigerator works between pressure limits of 1 bar and 4 bar. The temperature of the air entering the compressor is 15 ⁰ c and entering the expansion cylinder is 30 ⁰ c. The compression follows the law $PV^{1.35} = C$ and expansion follows the law $PV^{1.25} = C$ determine a) COP of the refrigeration cycle and b) The refrigeration capacity of the system if the circulation of air through the system is 0.5 kg/s. Take $r = 1.4$ and $C_p = 1.005 \text{ KJ/Kg-K}$? | 7 |
| 12 a) Explain the effect of superheating of suction vapour on the performance of vapour compression refrigeration system? | 3 |
| b) The capacity of a simple vapour compression refrigeration system using R-22 is 10 Ton of refrigeration. The evaporator and condenser temperatures are 10 ⁰ C and 30 ⁰ C Determine a) mass flow rate of the refrigerant in kg/s b) power required to run the compressor and c) COP. | 7 |
| 13 a) What are the advantages and limitations of lithium bromide refrigeration system? | 3 |
| b) Explain the working principle of steam jet refrigeration system with neat sketch? | 7 |
| 14 a) What are the desirable properties of an ideal refrigerant? | 3 |
| b) Explain boot strap refrigeration system with a neat sketch. | 7 |

- 15 a) Explain about any 3 air conditioning equipments. 3
 b) An air-conditioned space is to be designed for a small office room of winter conditions.

Outdoor conditions = 100C DBT and 80C WBT
 Required indoor conditions = 20C DBT and 60% RH
 Amount of free air circulation = 0.3 m³/min/person
 Seating capacity of the office = 50

The required condition is achieved first by heating and then by adiabatic humidifying find i) Heating capacity of the coil in kW ii) Surface temperature of the heating coil of by pass factor is 0.32 and iii) The capacity of the humidifier? 7

- 16 a) Explain why ventilation is required. 3
 b) An air conditioned room is maintained at 26C DBT and 50% RH. The sensible heat load of the room is 26.5 kW and room SHR is 0.82 Determine i) Room latent heat gain ii) the apparatus dew point temperature iii) the air supply to the room in m³/min? 7

- 17 Write any Two of the following : 2 x 5 = 10
 a) Compound compression system with water inter cooler and single expansion value
 b) Transport and industrial application of refrigeration and air-conditioning
 c) Thermo-electric refrigeration system

FACULTY OF INFORMATICS

BE 3/4 (IT) II-Semester. (Main & Backlog) Examination, May / June 2018

Subject: Artificial Intelligence

Time: 3 Hours

Max. Marks: 75

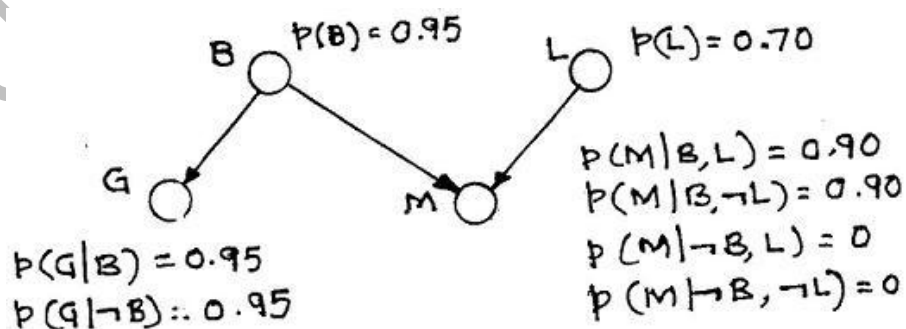
Note: Answer all questions from Part-A & any FIVE Questions from Part-B.

PART-A (25 Marks)

1. What classes of problems are addressed in AI? Why? [3]
2. You can change the state of a switch one at a time. There are two switches connected in parallel controlling a lamp powered by a common source. Initially, both the switches are in 'off' state. Draw the state-space representation of this system. [3]
3. What is Resolution Refutation? [3]
4. Compare the expressive power of Propositional Logic and Predicate Logic [2]
5. Discuss Inference over Prolog Clauses. [3]
6. Distinguish between Causal Reasoning and Diagnostic Reasoning in Bayes Networks. [2]
7. What are 'Expert Rules' in Expert Systems? [2]
8. What is the use of a Transition Network (TN) in sentence Analysis? [2]
9. What is Ontology? Give an example. [3]
10. State two challenges in Natural Language Processing. [2]

PART-B (50 Marks)

11. (a) Formulate a Heuristic Search Strategy for the 8-Slide Puzzle. [5]
(b) Show how the Heuristic you presented improves the search. [5]
12. (a) State and explain 'Logical Entailment' in Predicate Calculus. [5]
(b) Illustrate Block-World (three-blocks) in two different cases. Formulate wffs in predicate calculus for this illustration. [5]
13. (a) Design a formal mathematical model for Bayes Network. [5]
(b) For the Bayes Network given below, Solve $p(L|\neg M)$ [5]



14. (a) Explain clustering algorithm. Justify whether it is supervised or unsupervised learning. [5]
- (b) Sketch a 2x3x2 Feed forward Artificial Neural Network and show the calculation of output and error at the output layer as you proceed from input layer to output layer. Assume weights, inputs, activation function, and target-outputs. [5]

15. (a) Demonstrate with an example how the meaning of a sentence is extracted and presented using Case Grammar. [5]
(b) Explain the steps in the development of Ontology with an example. [5]
16. List three applications of Machine Learning and explain one application in detail bringing out the design aspects and learning techniques. [10]
17. Write comparative notes on: [4+3+3]
I. Expert System and learning system
II. Reasoning in Certain and Uncertain Worlds
III. OWL and UNL.

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FACULTY OF ENGINEERING

B.E. 3/4 (AE) I – Semester (Suppl.) Examination, May / June 2018

Subject: Finite Element Analysis

Time: 3 Hours

Max.Marks: 75

Note: Answer all questions from Part A. Answer any five questions from Part B.

PART – A (25 Marks)

- 1 State the equilibrium equations on three dimensional cartesian co-ordinates for elasticity problem.
- 2 What are advantages and limitations of finite element method?
- 3 State the properties of stiffness matrix.
- 4 Why transformation is required while solving truss problems? State transformation matrix for the truss element?
- 5 State the boundary conditions for the fixed beam subjected to point load.
- 6 Write displacement model for a triangular finite element.
- 7 Explain the terms isoparametric, subparametric and superparametric elements.
- 8 State the relation between Eigen value and natural frequency.
- 9 Explain the principle of minimum potential energy.
- 10 Extract the assembled stiffness matrix of two springs of stiffnesses K_1 and K_2 that are connected in series.

PART – B (5x10 = 50 Marks)

- 11 a) What are the assumptions made in plane strain and write stress-strain relations for plane strain? 5
 b) If a displacement field is described by $u = (-2x+3y^2+xy)x10^{-4}$ and $v = (x^2+5y-y^2)x10^{-4}$ determine ϵ_x , ϵ_y and ϵ_{xy} at $x=2$, $y=1$. 5
- 12 Derive stiffness matrix of the bar element by potential energy approach. 10
- 13 For the two bar truss shown in Fig. 1. Determine the displacement of node / and the stress on element 1-3. Take $E = 70 \text{ GPa}$ $A = 200 \text{ mm}^2$. 10

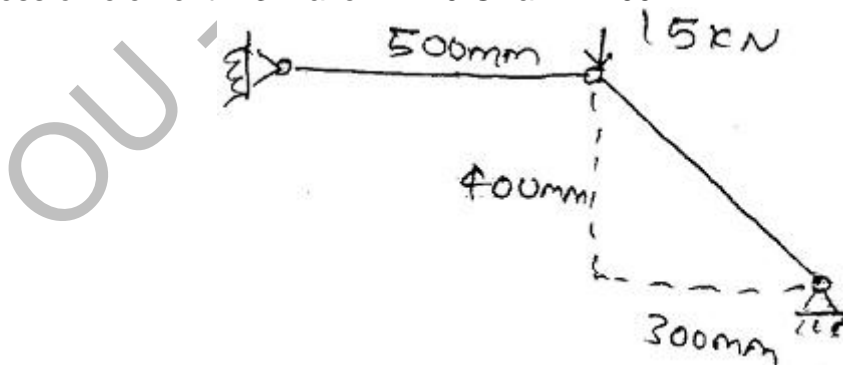


Fig. 1

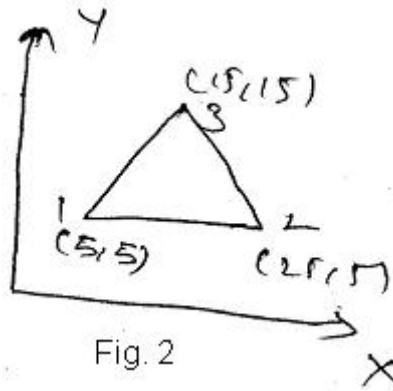
- 14 Derive the expression for deflection at the midpoint of a fixed-fixed beam subjected to point load at middle by finite element method. 10

15 For the plane stress element shown in Figure 2 the nodal displacements are

$$U_1 = 0.003 \text{ mm} \quad U_3 = 0 \quad U_5 = 0.004 \text{ mm}$$

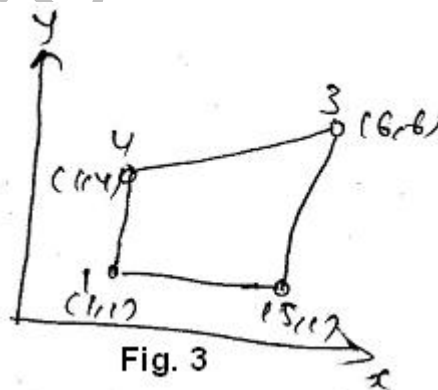
$$U_2 = 0.002 \text{ mm} \quad U_4 = 0 \quad U_6 = 0 \text{ mm}$$

Determine element stresses. Take $E = 200 \text{ GPA}$, $\nu = 0.3$ and unit thickness ($t=1$). 10



8 A four node quadrilateral element is shown in Figure 3. The nodal displacement vector is $U = [0, 0, 0.1, 0.21, 0, 0.15, 0.10, 0]^T$

- The x and y co-ordinates of a point P whose location in the element is given by $\xi = 0.5, \eta = 0.5$.
- The u, v displacement of the point P.



- Derive consistent mass matrix of a bar element. 8
- Explain how dynamic analysis is performed by characteristic polynomial approach. 2

FACULTY OF ENGINEERING

B.E. 3/4 (A.E) II-semester (Main & Backlog) Examination, May / June 2018

Subject: Finite Elements Methods

Time: 3 Hours

Max. Marks: 75

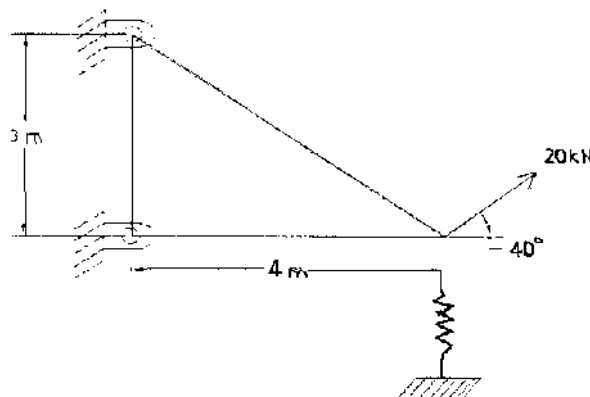
Note: Answer All Questions From Part-A, & any FIVE Questions From Part-B.

PART-A (25 Marks)

1. Differentiate between initial value problem and boundary value problem?
2. List various weight residual methods.
3. Define shape function.
4. List out the stiffness matrix properties.
5. Explain QST (Quadratic strain Triangle) element?
6. Define Iso-parametric element with suitable examples.
7. State the governing differential equation for 3-dimensional heat transfer problem with boundary conditions.
8. Express the element stiffness matrix of a truss element.
9. Derive strain displacement matrix for beam element.
10. List finite element technique software and general steps that followed in software.

PART-B (50 Marks)

11. The differential equation for a physical phenomenon is given by $\frac{d^2y}{dx^2} + y = 4x$, $0 \leq x \leq 1$ with boundary conditions as $y(0) = 0$ and $y(1) = 1$. Obtain one term approximate solution by using Galerkin method of weighted residuals.
12. Two-member plane truss supported by a linearly elastic spring as shown in Fig. 1 the truss members are solid circular cross section having $d = 30$ mm and $E = 100$ GPa. The linear spring has stiffness constant 50 N/mm. Calculate the displacements at each node and stress in each member.



13. For the beam shown in fig.2 determine the max displacement and the reaction forces and moments if $E = 200$ Gpa.

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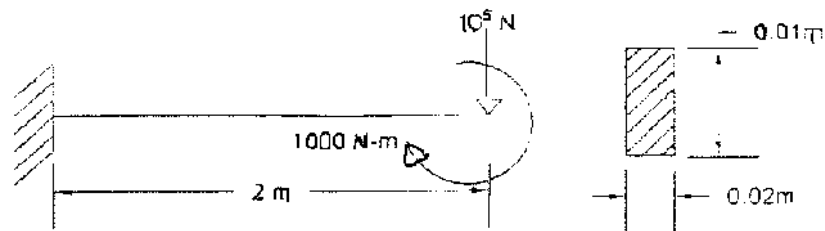


Fig. 2

14. Derive Jacobean and strain displacement matrix, and load vector for 3-node triangular element shown in Fig. 3 $E=80$ GPa, $\nu=0.28$, $P=15$ KN/m.

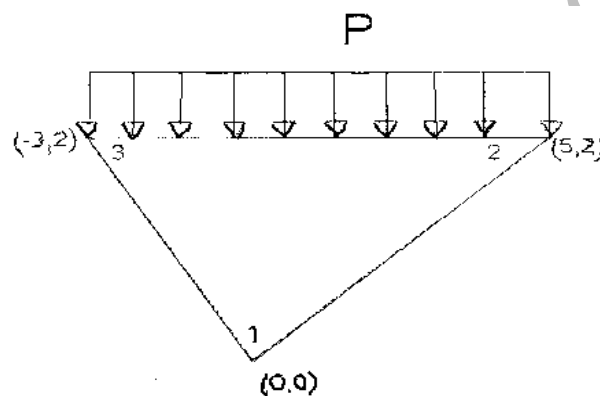


Fig. 3

15. A metallic fin which is 1 mm thick and 600mm long extends from a plane wall whose temperature is 300°C . Determine the temperature distribution from the fin to the air at 20°C with $h=9\text{W/m}^2\text{C}$. Take thermal conductivity of fin $K=20\text{W/m}^{\circ}\text{C}$, width of fin is 100mm.
16. Determine the Eigen values of and natural frequencies of a system whose stiffness and mass matrices are given below.

$$[K] = \frac{2AE}{L} \begin{bmatrix} 3 & -1 \\ -1 & 3 \end{bmatrix}, M = \frac{PAL}{12} \begin{bmatrix} 6 & 1 \\ 1 & 2 \end{bmatrix}$$

- 17 Derive the consistent mass matrix for truss element.

FACULTY OF ENGINEERING**B.E. 3/4 (CSE) Semester – II (Main & Backlog) Examination May/June 2018****Subject: Web Programming & Services****Time: 3 Hrs.****Max. Marks: 75****Note: Answer all questions from Part – A & any five questions from Part–B.****PART – A (25 Marks)**

- | | |
|--|---|
| 1. List out the different HTTP Request methods. | 2 |
| 2. What is CSS? Enumerate inline styles with examples | 3 |
| 3. What is an XML name Space? | 2 |
| 4. Differentiate between jsp include directive and include action tag. | 3 |
| 5. Write a simple java script code which can Multiply two(2) numbers and display the result. | 3 |
| 6. List the Life Cycle methods of filter | 2 |
| 7. What is the purpose of a DTD? | 2 |
| 8. What is Servlet? Explain different life cycle methods of a Servlet? | 3 |
| 9. What is the difference between result set object and Rowset object? | 2 |
| 10. Write short notes on .Net Remoting? | 3 |

PART – B (50 Marks)

- | | |
|--|---|
| 11. a) Create a HTML document that includes at least two images and enough text to precede the images, flow around them [One on left and one on right] and continuator the last image? | 6 |
| b) Explain briefly about XML parsers | 4 |
| 12. (a) Write in detail the steps required to deploy a J2EE application. | 5 |
| (b) What is session? Explain different session handling mechanisms? | 5 |
| 13.(a) Illustrate about Lists, tables with suitable examples in XHTML? | 6 |
| (b) What are the advantages of XML over HTML? | 4 |
| 14. (a) Explain in detail different JSP elements | 4 |
| (b) What is filter? Explain the life cycle methods of filter and write a filter to Authenticate the user? | 6 |
| 15. (a) Write short notes on Java Mail API | 5 |
| (b) Explain in detail different JDBC drivers | 5 |
| 16. (a) Create a dynamic Web page with JSP which illustrates the usage at actions and scripting. | 6 |
| (b) What is well-formed XML document? | 4 |
| 17. (a) Discuss in detail .Net architecture? | 5 |
| (b) Explain the two ways of using JDBC for database Connectivity? | 5 |
