FACULTY OF ENGINEERING

B. E. II – Semester (AICTE)(Main) Examination, May/June 2019

Sub: Programming for Problem Solving

Time: 3 Hours   **Max. Marks: 70**

Note: Answer all questions from Part- A & any five questions from Part-B

PART – A (20 Marks)

1) What is a compiler?
2) Difference between object code and executable code?
3) What is the output for the following code?

```
int main
{ int i=5;
  printf("%d %d %d", i++, i, ++i);
  return 0;
}
```

4) In what way does an array differ from an ordinary variable?
5) Write a function to find the sum of digits of a given number.
6) Write the algorithm for binary search.
7) Define recursion, with an example.
8) How to access structure elements? Give some examples.
9) Bring out with examples. Differences between array name and pointer.
10) What is a stream?

PART – B (5 x 10 = 50 Marks)

11. a) Write the algorithm for determining the remainder of a division operation where the dividend and divisor are both integers.   [5]
    b) Draw a flowchart for printing the sum of even terms contained within the numbers 0 to 20.   [5]

12. a) Describe the different types of operators that are included in C.   [4]
    b) Write a C program to convert the binary equivalent of an integer number without using array.   [6]

13. Explain how arrays are passed to a function with an example.   [10]

14. How do you define a structure within a structure? Explain with an example.   [10]

15. a) Why pointers should have data types when their size is always 4 bytes (in a 32-bit machine), irrespective of the variable they are pointing to?   [6]
    b) What are the primary advantages of using a data file?   [4]

16. a) How is a structure data type different from an array? Explain with an example. [5]
    b) Write a program that uses a function to search a number within an array.   [5]

17. Distinguish between the following with examples   [10]
    a) do- while and while loop
    b) break and continue

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FACULTY OF ENGINEERING

B.E II – Semester (AICTE) (Main) Examination, May / June 2019

Subject: Basic Electrical Engineering

TIME: 3 Hours   **Max. Marks: 70**

Note: Answer All Questions from Part – A & Any Five Questions From Part – B.

PART – A (10x2 = 20 MARKS)

1 State and explain Kirchoff's laws. [2]
2 Determine the voltages V_1, V_2 and V_3. [2]
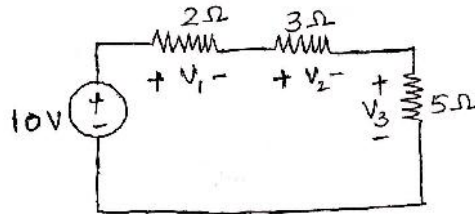
3 An alternating circuit takes a power of 14.2 kW at a power factor of 0.6 lagging. Find (i) apparant power and (ii) reactive power. [2]
4 Write the relationship between line and phase voltages and currents for the balanced delta connected system. [2]
5 State the Faraday's laws of electromagnetic induction. [2]
6 Compare 3- squirrel cage and slip ring induction motors. [2]
7 An 8 pole, lap wound armature has 1200 conductors and flux per pole of 0.02 wb. Determine the generated emf when running at 600 rpm. [2]
8 How are the 1- induction motor made self starting? [2]
9 Write the essential components of battery backup. [2]
10 List out the characteristics of battery. [2]

PART – B (5x10 = 50 MARKS)

11. a) State and explain Superposition theorem. [5]
 b) Evaluate current flow in 1 resistance in the circuit by using Thevenin's theorem. [5]
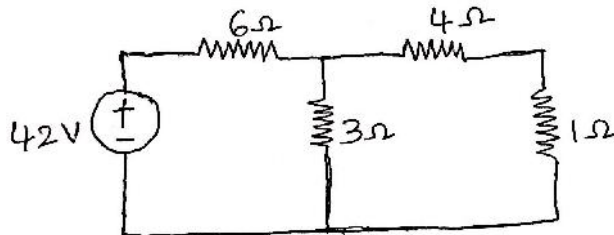
12. a) Show that $V_L = \sqrt{3}V_{Ph}$ in 3- balanced star connected system with the help of phasor
  diagram. [5]
 b) An alternating voltage is given by $v = 141.4 Sin314t$ V. Find (i) frequency (ii) rms
  value (iii) maximum value (iv) average value and (v) instantaneous value at t = 5ms. [5]

13. a) Explain the constructional details and principle of operation of 1-w transformer.   [5]

b) Explain generation of rotating magnetic field in 3-w induction motor.   [5]

14. a) Derive the emf equation of DC generator.   [5]

b) Explain the principle of operation of capacitor start induction motor.   [5]

15. a) Explain the different methods to improve the power factor of the system.   [5]

b) Explain what specifications for wires for domestic wiring are normally required.   [5]

16. a) State and explain Norton's theorem.   [5]

b) Differentiate 3-w balanced star and delta connected systems.   [5]

17 a) Write short notes on auto transformer.   [5]

b) Explain the principle of operation of DC motor.   [5]

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FACULTY OF ENGINEERING

B.E. 3/4 (Civil) II Semester (Old) Examination, May / June 2019

Subject: Water Resources Engineering and Management - I

Time: 3 Hours   Max. Marks: 75

Note: Answer all questions from part – A & Any five questions from part - B

Paper – A (25 Marks)

1 Write the Gumbel's expression for recurrence interval. [2M]
2 Obtain the relation between porosity , specific yield and specific retention. [3M]
3 Distinguish between initial and final regime. [2M]
4 State the important requirements of canal linings. [2M]
5 List the measures to be adopted for averting failure of a weir due to scour on the d/s of the structure. [2M]
6 Mention the conditions to be considered in the determination of top width of a weir. [3M]
7 State the circumstances in which a straight glacis canal fall is to be adopted. [2M]
8 List the functions of a head regulator. [3M]
9 State the general principles of project analysis. [2M]
10 List the phase involved in water resources planning and management. [4M]

PART – B (5x10 = 50 Marks)

11 (a) Explain the different types of precipitation. [3M]
   (b) A sub basin with an area of 1038 sq.km. has 7 stations. The normal annual rainfall depths for all 7 stations are given below. Determine the optimum number of rain gauge stations to be established in the basin if it is desired to limit the error in the mean value of rainfall to 10%. [7M]

Stations	1	2	3	4	5	6	7
Normal annual rainfall (cm)	62	94	62	47	32	88	70

12 A 4 hr hydrograph for a project site is given below. Calculate a 12 hr unit hydrograph. [10M]

Time (hr)	0	2	4	6	8	10	12	14	16	18	20	22	24	2
UH ordinates (cumec)	0	30	110	170	210	180	120	80	40	35	20	15	5	0

13 (a) Pumping at a rate of 1500 lpm from a 30 cm diameter test well penetrating into 60.0 m of unconfined aquifer gives drawdown of 2.0 m and 1.0 m in observation wells located respectively at 120.0 m and 160.0 m away from it. Calculate the hydraulic conductivity of the aquifer and drawdown of the pumping well. [6M]
   (b) Explain the process of determining the yield from an open well. [4M]

14 (a) A reservoir is proposed to be constructed to command an area of 1,20,000 ha. Sugar cane and paddy will be irrigated equal to 20% (each) of the command area in kharif and maize in 50% of the command area in rabi. Compute the storage required for the reservoir. Assume canal losses as 25% of the head discharge. [7M]
   (b) State the necessity of canal lining. [3M]

15 Explain the conditions to be considered for arriving at the bottom width of a vertical drop weir. [10M]

16 (a) Explain the design principles of a glacis fall for the d/s protection and u/s approach. [7M]

(b) Design a pipe cum open flume outlet for a discharge of 75 lps. The available working head is 0.45 m, and the full supply depth in the distributary is 1.5m. [3M]

17 (a) Differentiate between single and multipurpose projects. [2M]

(b) Explain the different steps involved in project formulation [4M]

(c) Explain the various approaches adopted in canal operation. [4M]

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FACULTY OF ENGINEERING

B.E. 3/4 (Civil) II-Semester (Backlog) Examination, May / June 2019

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	What are the different methods used in measurement of average rainfall?	2
2	Differentiate between permanent and temporary wilting points.	2
3	What are the assumptions made in Bligh's creep theory?	2
4	Classify various types of regulator.	2
5	Distinguish between a Canal siphon and an Aqueduct.	2
6	Enumerate various types of aquifer parameters.	3
7	List out the benefits of irrigation.	3
8	Differentiate between weir and a barrage.	3
9	List out the functions of outlets.	3
10	What do you understand by a cross drainage work? Explain.	3

PART – B (50 Marks)

11 a) State dupits assumptions for ground water flow? Derive expression for confined aquifer.   5

   b) An artesian tube well has a diameter of 20cm. The thickness of the aquifer is 30m and its permeability is 38m / day. Find the yield under a drawdown of 4m at the well face. Use radius of influence of the well as recommended by sic hard.   5

12 a) Derive the relation between duty and delta.   5

   b) Design a concrete lined channel to carry a discharge of 45 cumec at a slope of 1 is 10000. The side slope of the channel are 1.5:1, Take Manning's (n) as 0.025.   5

13 a) Outline the procedure involved in designing the structure using Bligh's creep theory.   5

   b) Explain the design principles of vertical drop weir.   5

14 a) Describe the working of Kennedy's gauge outlet with the help of a neat sketch.   5

   b) Explain the design principles of trapezoidal notch fall.   5

15 a) Write the criteria for selection of cross drainage works.   5

   b) What are the different types of cross drainage works? Explain with neat sketches aqueduct and siphon aqueduct.   5

16 a) Briefly explain the factors affecting runoff.   5

   b) Design a regime channel for a discharge of 50 and silt factor 1.1 using lacey's theory.   5

17 Write short notes on Two of the following :   10
   a) Balancing depth b) Hydrologic cycle   c) Limitations and types of canal lining

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FACULTY OF ENGINEERING

B.E. II – Semester (Backlog) (ECE/Inst/EEE) (NEW) Examination, May/June 2019

Subject: Managerial Economics and Accountancy

Time: 3 Hours   Max. Marks: 75

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

PART – A (25 Marks)

1)	Define Discounting Principle?	3
2)	What do you mean by Macro economics?	2
3)	What is meant by Cross elasticity of demand?	3
4)	Define Monopoly.	2
5)	Differentiate between Firm and Industry.	2
6)	Write about out of pocket cost and Imputed cost.	3
7)	What do you mean by variable or temporary working capital?	3
8)	State about the Pay back method.	3
9)	What do you mean by Bank Reconciliation statement?	2
10)	What is Trial balance error?	2

PART – B (5 x 10 = 50)

11) Elaborate the fundamental concepts of Managerial economics.

12) Bring out the features of Perfect competition.

13) Explain the Long-run production function.

14) Write about various sources of working capital.

15) Explain various concepts of Accountancy.

16) Calculate the profit-volume ratio and break –even point from the following details.

Fixed cost = Rs.3, 00, 000

Variable cost = Rs.20

Selling price per unit = Rs.30

17) There are the three projects A, B, C. The cost of the project is Rs.20,000 in each case. The cash inflows are as follows:

YEAR	PROJECT A	PROJECT B	PROJECT C
1	5000	8000	6000
2	5000	6000	4000
3	5000	4000	5000
4	5000	2000	5000
5	5000	1000	2000

Calculate payback of each project and compare the result.

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FACULTY OF ENGINEERING

B.E. 3/4 (M/P) II - Semester (Backlog) Examination, May / June 2019

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 Define the term Ton of refrigeration.	2
2 State difference between refrigerator and heat pump.	3
3 What are the advantages of cascade refrigeration system?	3
4 List the factors affecting vapour compression system.	2
5 What are the limitations of steam jet refrigeration?	2
6 Find the expression for the ideal COP for vapour absorption system.	3
7 State the absolute humidity and relative humidity.	2
8 List the main equipments used in air conditioning system.	3
9 Why ducts are used in air conditioning system?	2
10 Explain about By-pass factor for heating and cooling coil.	3

PART – B (50 Marks)

11 In an open cycle air refrigeration machine, air is drawn from a cold chamber at -2^0C and 1 bar and compressed to 11 bar. It is then cooled, at this pressure, to the cooler temperature of 20^0C and then expanded in expansion cylinder and return to the cold room. The compression and expansion are isentropic and follows the law PV^{14} = constant. Sketch the p-v and T-s diagrams of the cycle and for refrigerant of 15 tonnes, find : 1. Theoretical C.O.P., 2. Rate of circulation of air in kg/min,   3. Piston displacement per minute in the compressor and expander, and   4. Theoretical power per tonne of refrigeration.   10

12 A refrigerant -12 vapour compression plant producing 10 tonnes of refrigeration operates with condensing and evaporating temperatures of 35^0C and -10^0C respectively.. A suction line heat exchanger is used to sub cool the saturated liquid leaving the condenser. Saturated vapour leaving the evaporator is superheated in the suction line heat exchanger to the extent that a discharge temperature of 60^0C is obtained after an isentropic compression. Determine a) the sub cooling achieved in the heat exchanger   b) The refrigerant flow rate in Kg/s c) The cylinder dimensions of two cylinder compressor, if the speed is 900 rpm, stroke to bore ratio is 1.1 and volumetric efficiency is 80%   d) the COP of the plant and   e) Power required to drive the compressor in kW.
Note : take the properties from Refrigeration tables and p-h charts.   10

13 a) Derive an expression for finding out the mass of motive steam required per kg of water vapour produced.   5
  b) Explain with sketch the working principle of pulse tube refrigeration system and list the major field of applications of this system.   5

14 The humidity ratio of atmospheric air at 28^{0}C dry bulb temperature and 760mm of mercury is 0.016kg/kg of dry air. Determine by using psychometric relations :   10
   1. Partial pressure of water of water vapour
   2. Relative humidity
   3. Dew point temperature
   4. Specific enthalpy
   5. Vapour density

15 Explain with neat sketch the design consideration of summer air-conditioning system.   10

16 a) Sketch and explain a cascade refrigeration system. Draw cascase refrigeration cycle on T-S and P-h diagram.   5
   b) Draw a line diagram of 'Electrolux Refrigerator'. Explain the major significances of this system.   5

17 a) Describe with sketch any one air craft refrigeration system.   5
   b) Describe the major difficults experienced in transport air conditioning system.   5

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FACULTY OF ENGINEERING

B.E. 3/4 (A.E.) II – Semester (Old) Examination, May/June 2019

Subject: Finite Element Analysis

Time: 3 Hours   **Max. Marks: 75**

Note: Answer all questions from Part A & any five questions from Part B
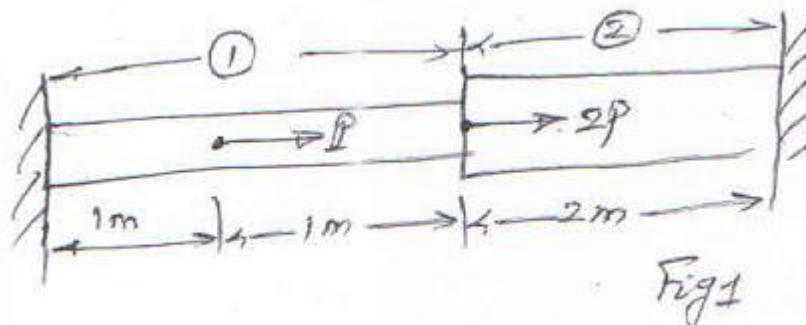
PART – A (10x2.5 = 25Marks)

1. What are boundary conditions? Write the compatibility equation?

2. Explain Galerkin's Approach.

3. Write the transformation matrix for truss element .

4. Differentiate between beam element and frame element and given their significance.

5. Find the element displacement of quadrilateral element at $3 = 0.5$ and $y = -0.5$ if

   nodal displacements are $\{0.0, 0.2, 0.3, 0.1, -0.2, -0.3, 0.0, -0.25\}^T, mm$

6. For the triangular element shown in fig. 1 (All dimensions in mm), if the coordinates of point P(1.5,2.5) then find the shape functions.
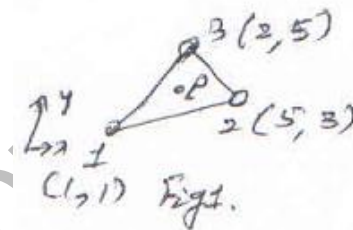
7. What is numerical integration and natural coordinates? Explain

8. Find the stiffness Matrix of torsion element of circular cross section.

9. Sketch 3D elements and show the degree of freedom.

10. What is capacitance Matrix? Derive for circular rod element?

PART – B (5 x 10 = 50 Marks)

11. For the axial element shown in fig. 1. Determine the displacement, strains and stress and reaction forces of E= 200 GPa, P = 10^5N, $2A_1 = A_2 = 10^{-8}$ m^2
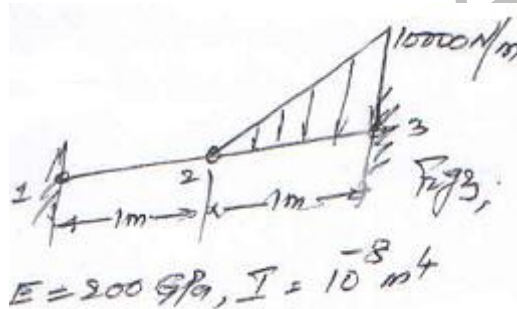
12. For the plane Truss shown in Fig.2 determine the displacements, stresses and reaction forces, if Area of crosssection of all members = $10^{-8}m^2$, E = 200GPa.
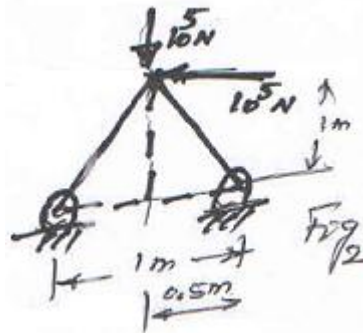

13. For the beam shown in fig.3, determine the deflection and bending stress if E = 200 GPa, $I = 10^{-8}$ m^4

14. a) Derive the strain displacement Matrix for assymmetric Traingular element.
    b) Sketch the variation of shape function of Traingular element.

15. a) Derive the shape functions and strain displacement matrix of 4-nodes Quadrilateral element.
    b) What is Gaussion quadrature? Explain.

16. Determine the nodal temperature of fin of diameter d=0.01m, k = 50 w/mi, h = 200 N/m^2c, T = 600^oC, use two elements only for Fig. 4
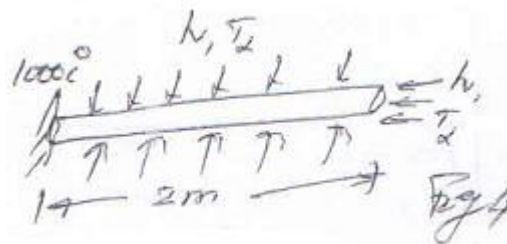
17. Determine the natural frequencies and mode shapes of cantilever beam as shown in Fig. 5. Take E = 200 Gpa, Diameter (d) = 0,01m, = 1000 kg/m^3. Consider Mass Matrix only.


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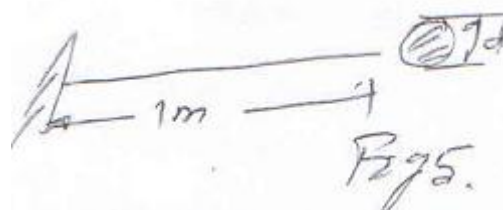
FACULTY OF ENGINEERING

B.E. 3/4 (AE) II - Semester (Backlog) Examination, May / June 2019

Subject : Finite Element Methods

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 is meant by node and element?
2 List various weight residual methods.
3 Define shape function.
4 What are the properties of stiffness matrix?
5 Represent constant strain triangle element isoparametrically.
6 State strain displacement relations of an axi-symmetric body subjected to axi-symmetric loading.
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 Sketch m transverse vibrations.
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 $\dfrac{d^2y}{dx^2} + 2y = 6x, 0 \le x \le 1$ 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 = 20 mm and E = 120 GPa. The linear spring has stiffness constant 60N/mm. Calculate the displacements at each node and stress each member.

Fig.1
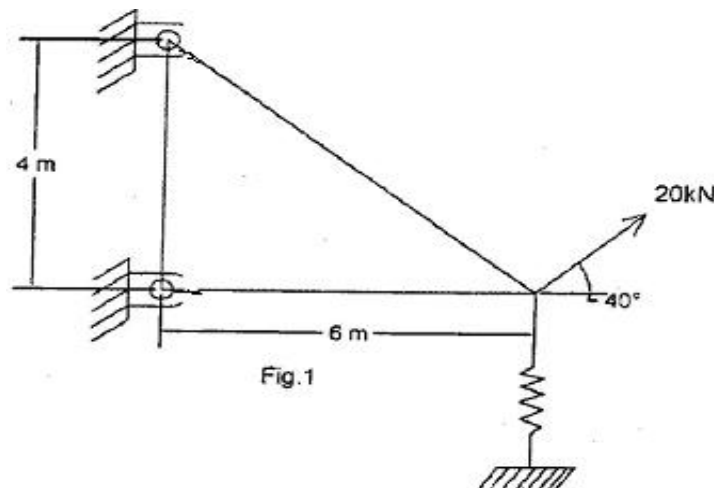
..2

13 For the beam shown in fig.2 determine the max displacement and the reaction forces and moments if E = 210 GPa.

Fig. 2
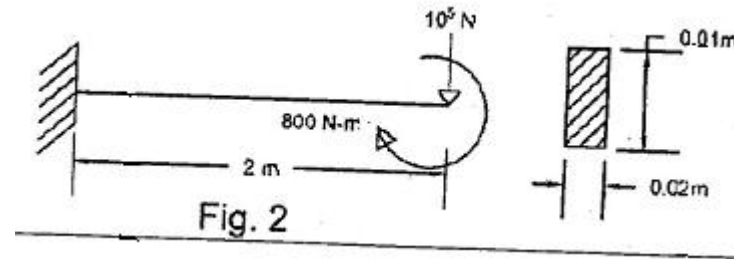
14 Determine the deflection at the midpoint of the fixed-fixed beam subjected to uniformly distributed load q N/m over length by finite element method.

15 A metallic fin which is 2mm thick and 500mm long extends from a plane wall whose temperature is 400^0C. Determine the temperature distribution from the fin to the air at 25^0C with h = 10 W/m2 ^{0}C. Take thermal conductivity of fin K = 30W/m ^{0}C, width of fin is 90mm.

16 Determine the first two natural frequencies of transverse vibrations of cantilever beam and plot mode shapes. Take E = 200 GPa, density = 7800 kg/m^3.

17 Derive the consistent mass matrix for truss element.

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FACULTY OF ENGINEERING

B.E. 3/4 (CSE) II-Semester (Backlog) Examination, May/June 2019

Subject : Web Programming & Services

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 Give the syntax of HTML table related tags.	2
2 Explain briefly how event handling can be done using Java script.	3
3 Explain deployment Descriptor, with an example.	3
4 What is a Java Bean?	2
5 What is the use of directives in JSP pages?	3
6 Differentiate between response.sendRedirect() and <jsp:forward>directive.	2
7 Write short notes on JNDI.	3
8 Distinguish between row set and results set objects.	2
9 What is web service framework?	2
10 What is common language runtime?	3

PART – B (50 Marks)

11 a) Write short notes on XML processors.   5
   b) Write short notes on HTTP protocol.   5

12 Explain in detail about various session management techniques in servlets with
suitable examples.   10

13 a) Explain in detail about securing web applications.   6
   b) Explain how we can create dynamic web pages with JSP.   4

14 a) Explain in detail the types of drivers of JDBC.   6
   b) Explain the significance of request dispatcher with an example.   4

15 a) Give short notes on .NET languages.   4
   b) Describe about validation controls in ASP.Net with syntax.   6

16 Explain about Events and Event handling done in Java script with suitable example. 10

17 Write a servlet program for login authentication. Use necessary html and
deployment descriptor codes.   10

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FACULTY OF ENGINEERING

B.E. 3/4 (IT) II - Semester (Backlog) Examination, May / June 2019

Subject : Artificial Intelligence

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 AI and list a few application of AI.	2
2	How is A* algorithm admissible?	3
3	Write the truth table showing the validity of $((P \lor H) \land \sim H) \to P$.	2
4	What is Plausibility?	2
5	What is logical entailment in predicate calculus?	3
6	Give Bayes rule, explain its use with an example.	3
7	Define joint probability and conditional probability.	3
8	What is a neural network? What are its different layers?	2
9	What is an artificial neuron?	2
10	Distinguish supervised and unsupervised learning.	3

PART – B (50 Marks)

11 A farmer wants to get lion, a goose, a fox and some rice across the river. These is a boat, but farmer can take only one passenger in addition to himself on each trip or else can take both lion and the rice or both the fox and rice. The goose will each rice, fox will eat goose and lion will eat fox. Using state space search, show how he managed to get everything across the river.   10

12 Describe 8-puzzle in terms of start state, goal state and exhaustive search.   10

13 Dr. Somebody, Dr. Anybody and Dr. Nobody are computer scientists. We know the following facts about them.   10
    a) Dr. Somebody is an associate professor.
    b) Dr. Nobody is an assistant professor and has published papers with Dr. Anybody.
    c) Dr. Anybody is either an associate professor or an assistant professor but not both and has published papers with Dr. Somebody.
    Use resolution refutation to prove that an assistant professor has published papers with an associate professor.   10

14 Explain different phases in expert system with a neat diagram.   10

15 Define perception and design a perception for Boolean function OR.   10

16 Describe natural language processing in detail and write a short note on two parsers.   10

17 Write short notes on :   10
    a) Semantic Network
    b) Frames
    c) Information Gain

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