

FACULTY OF ENGINEERING

B.E. (Civil) VI – Semester (CBCS) (Suppl.) Examination, December 2019

Subject: Theory of Structures – II

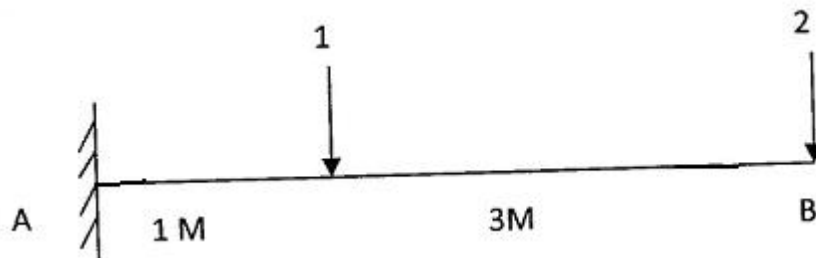
Time: 3 Hours

Max.Marks: 70

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

PART – A (10x2 = 20 Marks)

- 1 A single point load of magnitude 10 kN crosses a simply supported beam of span 20 m construct the curve of maximum bending moment for the beam.
- 2 State the condition to obtain the maximum bending moment that can occur under a particular chosen wheel load, when a series of wheel loads move across a simply supported beam.
- 3 Define the influence line diagram for force in member of truss.
- 4 The cable of a suspension bridge of 200 m span and central dip 15 m has its supports at the same level. Calculate the length of cable.
- 5 Why the flexibility method of analysis is called the force method also?
- 6 Find the support reaction at the prop of a proposed cantilever beam of length 'l' subjected to an UDL of intensity 'W' per unit length using flexibility method.
- 7 Define stiffness and explain stiffness coefficient K_{23} .
- 8 Develop the stiffness matrix for the beam shown in Fig. 1.

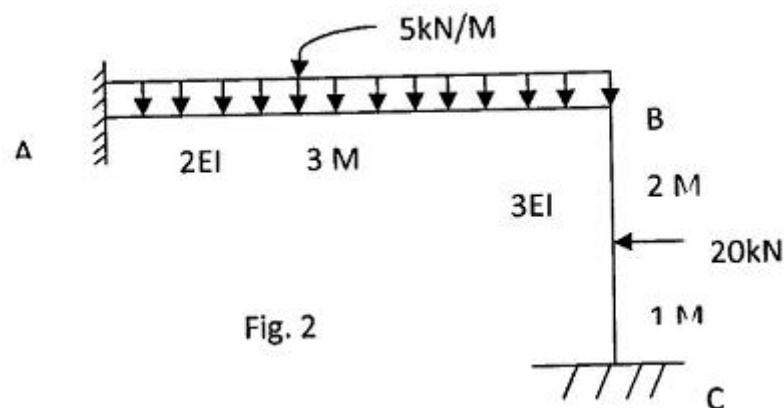


- 9 State the advantages of direct element method.
- 10 A structure has the following stiffness matrix. Develop flexibility matrix.

$$(K) = EI \begin{bmatrix} 3 & 1 & 0 \\ 1 & 3 & 0.5 \\ 0 & 0.5 & 1 \end{bmatrix}$$

PART – B (5x10 = 50 Marks)

- 11 A series of point loads 170 kN, 150 kN, 160 kN, 200 kN, 120 kN, 120 kN and 80 kN all spaced at 2 m intervals, with 170 kN load leading crosses a simply supported girder of span 30 m left to right. Determine the maximum shear force and maximum bending moment at 12 m from left support.
- 12 A Pratt truss has 6 panels of 5m each and height 4m is subjected to a dead load of 20 kN/m and a live load of 50 kN/m longer than the span. Find the maximum force in the bottom chord, top chord and inclined members of the third panel from the left support.
- 13 Analyze the frame shown in Fig. 2 by using flexibility matrix method. Draw the BMD.



- 14 Analyze the plane frame shown in Fig. 3 using stiffness matrix approach. Also draw BMD.

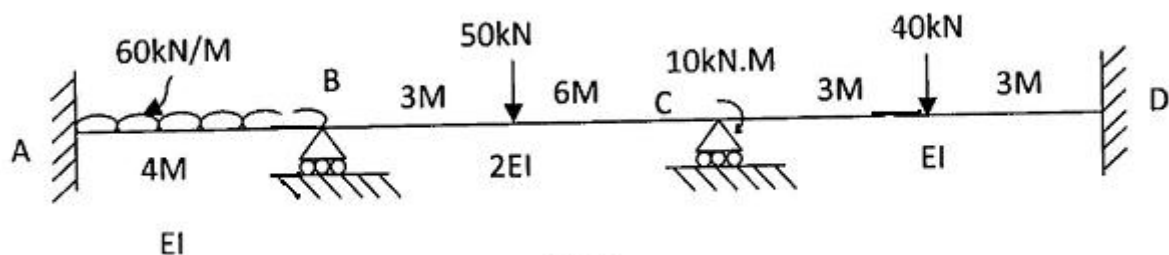


Fig. 3

- 15 Analyze the truss shown in Fig. 4 by using flexibility matrix, AE constant for all members.

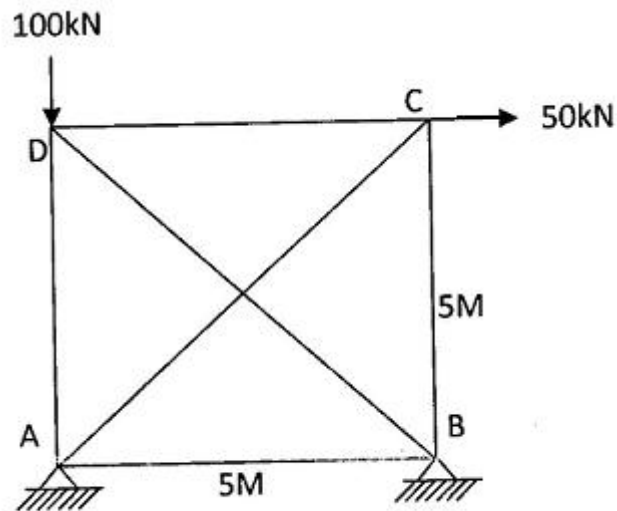


Fig. 4

- 16 A cable supported at its end 40 m apart at the same level carries loads 200 kN, 100 kN and 150 kN at 10 m, and 30 m from the left end respectively. If the point where 100 kN is acting below the level of support, find the length of the cable and the cross sectional area required of the cable if the permissible tensile stress is 150 MPa.
- 17 Two wheel loads of 60 kN and 40 kN spaced at 6 m apart cross a girder of span 16 m with 40 kN load leading. Draw the Max SFD and Max BMD.

FACULTY OF ENGINEERING**B.E. (EEE) VI-Semester (CBCS)(Suppl.) Examination, December 2019****Subject : Switch Gear and Protection****Time : 3 Hours****Max. Marks: 70****Note: Answer all questions from Part-A & any five questions from Part-B.****PART – A (20 Marks)**

- 1 A relay operates with a rated current of 5 A has a relay setting of 150 percent. It is connected to a power system through a CT of 400/5 ratio. If the fault current is 6000 A, determine the plug setting multiplier of the relay. (2)
- 2 Draw the Time current characteristics of various relays. (2)
- 3 Draw the block diagram of microprocessor based over current relays. (2)
- 4 Define the terms (2)
 - (a) Symmetrical breaking current
 - (b) Asymmetrical breaking current
- 5 What are the causes of over voltages? (2)
- 6 Give a brief note about the arc interruption theories. (2)
- 7 Derive the torque equation of an Reactance relay. (2)
- 8 Explain about generator transformer unit protection. (2)
- 9 Write the differences between Amplitude comparator and phase comparator. (2)
- 10 Give a brief note about the zones of protection. (2)

PART – B (50 Marks)

- 11 (a) Mention the types of amplitude comparators. (3)
 - (b) Give a brief note about the duality between Amplitude comparator and phase comparator. (7)
- 12 (a) With a neat diagram explain the biased percentage differential relay. (6)
 - (b) What is meant by time setting multiplier of an over current relay. (4)
- 13 (a) Explain with neat diagram the construction and working of induction type disc type relay. (7)
 - (b) What are the advantages of micro processor based relays. (3)
- 14 (a) Define current chopping. (2)
 - (b) Explain with neat diagram the construction and working of Minimum Oil Circuit Breaker and also mention the advantages and disadvantages of it. (8)
- 15 (a) Write the applications of expulsion type lightning arresters. (3)
 - (b) Describe the construction and principle of operation of valve type lightning arrestor. (7)
- 16 (a) What is magnetizing inrush current? (2)
 - (b) Discuss the protective scheme which protects the transformer against faults but does not operate in case of magnetizing in rush current. (8)
- 17 Write short notes on
 - (a) Protective scheme for the Ring Main System (4)
 - (b) Resistance switching (3)
 - (c) Expulsion type Lightning Arrester (3)

FACULTY OF ENGINEERING**B.E VI Semester (CBCS) (Inst.) (Suppl.) Examination, December 2019****Subject: Process Control****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 Gibb's Phase Rule? [2]
- 2 A flow head device has an equation $q = h^n$, calculate the resistance. [2]
- 3 Define differential gap. [2]
- 4 What are the different signal transmission standards in process industries [2]
- 5 What is velocity error? [2]
- 6 Define stabilization time. [2]
- 7 Explain the operation of solenoid valve. [2]
- 8 Explain the function of hydraulic Actuator. [2]
- 9 Explain the function of counters in PLC programming. [2]
- 10 Draw the ladder diagram for AND Gate. [2]

PART – B (50 Marks)

- 11 With a neat diagram explain non-interacting systems and also find it's transfer function. [10]
- 12 Explain the P+D controller operation. Write all the relevant equations and graphical interpretation and also obtain its electronic implementation. [10]
- 13 a) Explain in detail about single speed floating controller. [5]
b) With a schematic diagram explain the pneumatic Proportional controller. [5]
- 14 a) Explain control valve sizing and selection . [5]
b) With neat diagrams explain the Electrical Actuators. [5]
- 15 a) Explain the Ziegler Nichols method for controller tuning. [5]
b) Compare the effects of PI, PD, PID actions on time constant Process. [5]
- 16 a) Explain the block digram of Discrete-state process control. [5]
b) Explain the PLC operarion. [5]
- 17 Write short notes on: [10]
 - a. Temperature Process
 - b. Pneumatic valve positioner
 - c. Integral controller

FACULTY OF ENGINEERING**B.E. (ECE) VI – Semester (CBCS) (Suppl.) Examination, December 2019****Subject: Antennas and Wave Propagation****Time: 3 Hours****Max.Marks: 70****Note: Answer all questions from Part-A and any five questions from Part-B****PART – A (10x2 = 20 Marks)**

- 1 Write an expression for power radiated by a Hertzian dipole. 2
- 2 What is radiation resistance? Calculate the radiation resistance of a $\lambda/10$ wire dipole antenna 2
- 3 Distinguish between sectoral and pyramidal horns with neat sketches 2
- 4 What are the different types of designs of a Rhombic antenna? Mention its disadvantage. 2
- 5 What are the differences between binomial and linear arrays? 2
- 6 List some advantages of pattern multiplication. 2
- 7 State the relation between critical frequency and electron density of an ionospheric layer. 2
8. What is the significance of pitch angle in a Helical antenna? 2
9. What is the free space loss factor? 2
10. What are E-plane and H-Plane patterns? 2

PART – B (5x10 = 50 Marks)

- 11 a) Explain the following terms with respect to an antenna (i)HPBW (ii)Directivity (iii)radiation intensity (iv)Antenna efficiency (v)Radiation resistance (vi)Beam area. 6
b) Explain antenna polarization? 4
- 12 Show that the radiation resistance of half wave dipole antenna is 73Ω . 10
- 13 a) Draw the structure of three elements Yagi-Uda antenna and Explain its working with one folded dipole ,one director and one reflector. 6
b) What are the advantages of and disadvantages of lens antenna? 4
- 14 a) Derive the array factor of n-elements uniform linear array. 7
b) What is antenna array? State the reasons for using it. 3
- 15 (a) Explain in detail about ground wave propagation. 6
b) Show that the ionosphere acts as a medium of varying refractive index by deriving necessary equations. 4
- 16 a) Obtain the maximum effective aperture area of half wave dipole antenna. 5
b) Explain the working principle of microstrip antenna and also give its advantages and disadvantages. 5
- 17 Write a short note on: 10
a) Duct Propagation
b) Broadside and endfire arrays.

FACULTY OF ENGINEERING

BE VI Semester (CBCS) (Mech.) (Supple.) Examination, December 2019

Subject: Hydraulic Machinery & Systems

Time: 3 Hours

Max. Marks: 70

Note: i) Answer all questions from Part-A, & answer any five questions from Part-B.

ii) Missing Data if any may be suitably be assumed.

PART – A [10 x 2 = 20 Marks]

- 1 Define the impulse momentum equation? [2]
- 2 Differentiate between positive displacement pumps and roto-dynamic pumps? [2]
- 3 Explain the functions of air vessels in reciprocating pump? [2]
- 4 A double acting reciprocating pump having piston area 0.1 Square meter and 0.4m stroke runs at 60 rpm. Calculate its theoretical discharge in cubic meters per second? [2]
- 5 Define specific speed of pump. Also write its expression? [2]
- 6 A Centrifugal pump is required to lift water to a total head of 40m at the rate of 50 lit/sec. If the overall efficiency is 62%, calculate the power required for the pump? [2]
- 7 Define gross head, net head and efficiency of turbine. [2]
- 8 Differentiate between Kaplan and Propeller turbine? [2]
- 9 What are the desired properties of hydraulic oils? [2]
- 10 Write the construction details of single acting Actuator? [2]

PART – B [10 x 5 = 50 Marks]

- 11 A jet of water of diameter 50 mm moving with a velocity of 20 m/s strikes a fixed plate in such a way that the angle between the jet and the plate is 60° . Find the force exerted by the jet on the plate
 - (i) in the direction normal to the plate
 - (ii) in the direction of jet. [10]
- 12 A single acting reciprocating pump has a plunger of diameter 0.3m and stroke of length 0.4m. If the speed of the pump is 60 rpm and coefficient of discharge is 0.97, determine the percentage slip and actual discharge of the pump. [10]
- 13 What is manometric efficiency of a centrifugal pump? Define with the help of a sketch. Differentiate it from volumetric efficiency and mechanical efficiency. [10]
- 14 Find the number of pumps required to take water from a deep well under a total head of 156 m. Also the pumps are identical and are running at 1000 rpm. The specific speed of each pump is given as 20 while the rated capacity of each pump is 150 liters/s. [10]
- 15 Write is the classification of turbines? How do you differentiate among low head, medium head and high head turbines? [10]
- 16 Design a pelton wheel for a head of 80 m and speed 300 rpm. The pelton wheel develops 103 kW shaft power. Take $C_v = 0.98$, speed ratio = 0.45 and overall efficiency = 0.80. [10]
- 17 Explain working principles of centrifugal pumps with neat sketch. [10]

FACULTY OF ENGINEERING**B. E. (Production) (CBCS) VI – Semester (Supple.) Examination, December 2019****Subject: Modern Machining and Forming Methods****Time: 3 hours****Max. Marks: 70****Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.****PART – A (10 x 2 = 20 Marks)**

1. Classify unconventional machining processes according to major energy source employed.
2. Identify the mechanism of material removal, transfer media and energy source for AJM.
3. Enlist the characteristics of an electrode material in order to serve as a good tool in EDM.
4. Summarize are the parameters that affect the MRR? How the current density affect the MRR?
5. Recall the characteristics of laser used in laser machining.
6. Illustrate and remember the basic heating phenomenon that takes place in plasma arc welding.
7. Recall the principle of marforming.
8. Summarize any two specific applications of (i) HERF (ii) EHF.
9. Distinguish between tube and cone spinning process.
10. Recall the process principle of water hammer forming.

PART – B (5 x 10 = 50 Marks)

11. (a) Describe the principle and working of a USM with a neat sketch. List the advantages, limitations and applications of USM. Discuss about the control of quality in machining in USM.
(b) Explain the different applications and process control features of WJM.
12. (a) With the help of a neat diagram, enumerate the sequence of events constituting the process of metal removal from the work piece by a single discharge in EDM process?
(b) Discuss about the effect of high temperature and pressure of electrolyte on the ECM process.
13. (a) Explain the thermal features of Laser beam machining. Discuss the performance of various types of Lasers.
(b) Summarize the effect of process parameters on the machined surface of EBM.
14. (a) Distinguish between confined and unconfined explosive forming processes with neat sketches.
(b) Distinguish between EHF and HERF.
15. (a) Explain Hydroforming in detail. Effect of process parameters on the product geometry in tube spinning.
(b) Distinguish between forward and backward spinning process with respect to principle, advantages, limitation and applications.
16. (a) Rephrase the mechanism of material removal in WJM.
(b) Explain the chemistry involved in the ECM process.
17. (a) Compare between LBM and EBM on the basis of their application and limitations.
(b) Distinguish between hydrostatic forming and water hammer forming with respect to principle, advantages, limitation and applications.

FACULTY OF ENGINEERING**B. E.VI – Semester (CBCS)(A.E)(Suppl.) Examination, December 2019****Subject: Computer Aided Design Analysis and Manufacturing****Time: 3 Hours****Max. Marks: 70****Note: Answer all questions from Part – A & any five questions from Part-B****PART – A (10 x 2 = 20 Marks)**

1. State the CAM tools required to support a Cad /Cam system from planning to assembly.
2. State the most common solid entities used as primitives for solid modeling.
3. State the 4 types of Cad /Cam data bases.
4. Definition of z-axes -2 axis, 2 ½ axis, 3 axis, multi axis of machine tools.
5. Explain difference between repeatability and accuracy of robot with neat sketch.
6. State the advantages of non-contact over contact measurement in quality inspection.
7. Distinguish four differences between wireframe and surface modeling.
8. State the mathematical representation of (i) analytical (ii) synthetic surfaces – 2m
9. What is geometric definition of solid model?
10. Define a hermite cubic spline curve.

PART – B (50 Marks)

11. (a) Discuss the characteristics of Bezier Curve on the Bernstein Polynomials. 5
(b) Explain the Cad /Cam system evaluation criteria with respect to
(i) System consideration, 5
(ii) Geometrical modeling capabilities. 5
12. (a) Explain the polyhedral classes used in B-rep solid modeling. 5
(b) In geometric transformation – state the transformation matrix for
(i) scaling 5
(ii) reflection. 5
13. (a) Explain the FEM steps to solve continuum problems in engineering. 5
(b) Explain IGES file (i) data representation (ii) file structure and format. 5
14. (a) Sketch the arrangement of (i)NC (ii) CNC (iii) DNC based on the controller structure. 5
(b) Explain absolute programming and incremental programming with an example.. 5
15. (a) In critical component manufacturing, write application notes on (i) Rapid Prototyping, (ii) Reverse engineering. 5
(b) Explain ten industrial applications of robot end effectors. 5
16. (a) Explain the working of non-contact type measurement devices in CAD/CAM. 5
(b) Explain the FEM steps to solve continuum problems in engineering. 5
17. (a) Discuss the advantages of parametric programming in designing surfaces. 5
(b) Analyse the common modelling methods available for surface design in a surface modeling software. 5

FACULTY OF ENGINEERING**B.E. VI-Semester (CBCS) (CSE) (Suppl.) Examination, December 2019****Subject : Web Programming****Time : 3 Hours****Max . Marks: 70****Note:** Answer all questions from Part–A & any five questions from Part -B.**PART- A (20 Marks)**

- 1 Explain about Web Servers and HTTP. (2)
- 2 List any four input controls in HTML5. (2)
- 3 Write JavaScript function to validate pincode. (2)
- 4 What is the purpose of deployment descriptor? (2)
- 5 What are difference ways of writing JSP code. (2)
- 6 Explain Servlet life cycle with a diagram. (2)
- 7 Why is Ajax used in web development? (2)
- 8 Explain flow of control in Python with example. (2)
- 9 Explain XSLT in XML. (2)
- 10 Write about database access in PHP. (2)

PART- B (50 Marks)

- 11 a) Write an HTML5 form program to create Employee data base using atleast six input form controls. (6)
b) Explain about <div> and tags in HTML (4)
- 12 a) Explain Document Type Definition and Namespaces. (4)
b) Write a program to display XML document using XSLT. (6)
- 13 a) Explain conditional statements and loops in JavaScript. (5)
b) Write a PHP program to handle HTML forms. (5)
- 14 a) Write python program to create dynamic web page. (5)
b) Explain how many ways python program can be executed. (5)
- 15 a) Explain benefits of using Servlets over CGI. (4)
b) Write a Servlet program to retrieve data from an HTML form. (6)
- 16 a) Explain different types of sessions handling in Servlets. (4)
b) Explain JSP tags and implicit object in JSP. (6)
- 17 Write short notes on:-
(a) Pattern matching in Javascript. (3)
(b) Java Database Connectivity. (4)
(c) Differences between Cookies and Session Object. (3)

FACULTY OF ENGINEERING

B. E.VI – Semester (CBCS)(I.T.)(Suppl.) Examination, December 2019

Subject: Compiler Construction

Time: 3 Hours

Max. Marks: 70

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

.PART – A (10 x 2 = 20 Marks)

- | | | |
|-------------------------------------|--|----|
| 1 | Define Cross Compiler. | 2 |
| 2 | What are the different programs related to compiler? | 2 |
| 3 | Write the difference between a pass and a phase | 2 |
| 4 | Define left recursion and remove left recursion from the following grammar:
$E \rightarrow E + T \mid T$ $T \rightarrow T \times F \mid F$ | 2 |
| 5 | What are different Bottom-up parsing techniques? | 2 |
| 6 | Write the Attribute grammar from
$\text{number} \rightarrow \text{number} / \text{digit}$ $\text{digit} \rightarrow 0 / 1$ | 2 |
| 7 | Define Synthesized and Inherited Attributes. | 2 |
| 8 | Evaluate the following expression in Quadruple and Triple form:
$a := b \times c + b \times c \mid d$ | 2 |
| 9 | Design DAG for the following code:
$a = b + c$ $b = b - d$ $c = c + d$ $e = b + c$ | 2 |
| 10 | What is Back-patching? | 2 |
| PART – B (5 x 10 = 50 Marks) | | |
| 11 | (a) Explain the major data structures in a compiler. | 5 |
| | (b) Explain the Bootstrapping and Porting process. | 5 |
| 12 | Construct a DFA of LR (0) items and the parsing table for the following grammar and show all the moves for the parsing of the input string ((a)) using the table:
$A \rightarrow (A) \mid a$ | 10 |
| 13 | Construct Predictive parsing for the following Grammar and parse the string : ab
$S \rightarrow AaAb \mid BbBa$ $A \rightarrow$ $B \rightarrow$ | 10 |
| 14 | Give attribute grammar for the following grammar and also draw the parse tree for the string $w = \text{float } x, y.$
$\text{decl} \rightarrow \text{type var-list}$ $\text{type} \rightarrow \text{int/float}$ $\text{var-list} \rightarrow \text{id, var-list/id}$ | 10 |

- 15 What is a symbol table? Discuss the contents of the symbol table and explain the techniques for organizing the symbol table? 10
- 16 (a) Explain the data-flow analysis framework. 5
- (b) Generate code for the following sequence assuming x, y, z are in memory locations. 5
- if x < y go to L1 ,
- z = 0
- go to L2
- L1 : z = 1
- 17 Write short notes on the following:
- (a) Lex 3
- (b) Garbage Collection 3
- (c) Register allocation 4

FACULTY OF ENGINEERING**B.E. 3/4 (Civil) II - Semester (Backlog) Examination, December 2019****Subject : Structural Engineering Design and Detailing – I (RCC)****Time : 3 hours****Max. Marks : 75**

Note: Answer all questions from Part-A. Answer any One question from each unit from Part-B. Assume suitable data if required.

PART – A (25 Marks)

- | | |
|---|---|
| 1 Differentiate between isolated footing and combined footing. | 2 |
| 2 What is retaining wall, explain the need for it. | 3 |
| 3 What are the IS specifications required for design of water tanks. | 3 |
| 4 What is minimum eccentricity, how do you check for the same. | 2 |
| 5 How do you calculate the base width of the cantilever retaining wall? | 3 |
| 6 How do you calculate the thickness of the cylindrical wall. | 3 |
| 7 What is dispersion length, explain? | 3 |
| 8 What is proportional load, how do you arrive the same? | 2 |
| 9 What is the importance of IRC 5, explain? | 2 |
| 10 Differentiate between class B and class AB loadings. | 2 |

PART – B (50 Marks)**Unit-I**

- 11 Design a combined footing for the two columns of a multistoried residential building using the following data : 15
- | | | |
|---------------------------|---|------------------------|
| Size of the column | = | 600mm x 600mm |
| Axial load on each column | = | 1200kN |
| Spacing of the column | = | 5mc/c |
| SBC of the soil | = | 240kN/m ² |
| Materials used | = | M35, Fe550 grade steel |

OR

- 12 Design a counter fort retaining wall for the following data : 15
- | | | |
|---------------------------------|---|-----------------------|
| Height of fill retained by wall | = | 9m |
| Surcharge angle | = | 11° |
| Density of the soil | = | 19kN/m ³ |
| Angle of internal friction | = | 31° |
| Coefficient of friction between | | |
| Soil and base slab | = | 0.50 |
| SBC of the soil | = | 280 kN/m ² |
| Materials used | | M30 and Fe550 |

Unit-II

- 13 Design a circular water tank resting on the ground with a flexible base and a spherical dome using the following data : 15
- | | | |
|----------------------------|---|--|
| Capacity of the water tank | = | 8,00,000 liters |
| Depth of the storage | = | 6m |
| Free board | = | 600mm |
| Materials used | | M35 grade concrete and Fe550 grade steel |

OR

..2

- 14 Design an Intz type of water tank to store 2.8 million litres of water. The height of the tank above ground level is 14m. Depth of foundation is 4.0m below ground level, basic wind pressure 4.0 kN/m^2 number of supporting columns = 12. Adopt M30 grade concrete and Fe550 grade steel. Design the top ring beam, bottom ring beam, conical dome and bottom spherical dome. Use IS specifications. IS 456 and IS 3370 for design. 15

Unit-III

- 15 An RCC deck slab bridge is to be constructed over a trapezoidal channel of 7.0m base width and side slopes 1 : 1 laid at a bed slope of 0.4 m/km. Design the slab bridge with the following information. 20
Chezy's constant : 70
Bed level of stream : 100m
Full supply level : 102m
Materials : M35 grade concrete Fe550 grade steel
Loading : IRC class-AA (Tracked vehicle)
Road width : 6.8m
Foot path : 680mm on either side

OR

- 16 a) Explain the design procedure for composite bridges. 5
b) Design a deck slab bridge for the clear span of 7m width of the footpath 1.0m on either side, wearing coat 90mm, use IRC class AA (Tracked vehicle, M30 and Fe500)? 15

FACULTY OF ENGINEERING**B.E. 3/4 (EE / Inst.) II – Semester (Backlog) Examination, December 2019****Subject: Microprocessors and Microcontrollers****Time: 3 Hours****Max.Marks: 75****Note: Answer all questions from Part – A and any five questions from Part – B.****PART – A (25 Marks)**

- | | | |
|----|---|---|
| 1 | Explain operation of the following pins of 8086
i) LOCK
ii) BHE
iii) INTA | |
| 2 | What are the functions of CS & SS registers? | 3 |
| 3 | Mention important features of Bus Interface unit in 8086 microprocessor architecture. | 3 |
| 4 | List various development tools in assembly language programming. | 2 |
| 5 | Write 8086 assembly language program to add two 16 bit numbers. | 3 |
| 6 | Write BSR mode of 8255 PPI. | 3 |
| 7 | List various addressing modes of 8051 microcontrollers. | 2 |
| 8 | Mention the I/O ports of 8051. | 2 |
| 9 | Mention the important features of 8051. | 2 |
| 10 | Write the various interrupts of 8051 microcontroller. | 2 |

PART – B (5x10 = 50 Marks)

- | | | |
|----|--|----|
| 11 | Explain in detail with examples all the addressing modes of 8086 microprocessor. | 10 |
| 12 | Explain the following 8086 instructions with examples.
i) Rotate and shift instructions
ii) Program control instructions | 10 |
| 13 | a) Explain the following assembler directives of 8086.
i) ASSUME
ii) ORG
iii) PAGE
iv) EQU
v) END
b) Write a 8086 program to find the average of 16 bit ten numbers in an array. | 5 |
| 14 | Draw the block diagram of 8253 and explain the features in detail with its control word format. | |
| 15 | Draw the architecture of 8051 instructions with examples. | 10 |
| 16 | Explain the following 8051 instructions with examples.
i) Data movement instructions
ii) Arithmetic and logical instructions | 10 |
| 17 | a) With a diagram explain seven segment LCD display interfacing with 8051 microcontroller.
b) Explain briefly Serial I/O of 8051 microcontroller. | 5 |

FACULTY OF ENGINEERING
BE 3/ 4 (ECE) II-Semester (Old) Examination, December 2019

Subject: Computer Organization and Architecture

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 computer organization and Architecture. | 3 |
| 2 What is the alignment and normalization in floating point number system? | 2 |
| 3 Distinguish between hardwired and micro-programmed control unit. | 3 |
| 4 List out the various phases of instruction cycle. | 2 |
| 5 Explain Pipelining concept in general purpose computer. | 2 |
| 6 Explain stack organization of the computer. | 3 |
| 7 What are the merits and demerits are of programmed I/ O, Interrupt driven I/ O and DMA data transfer? | 3 |
| 8 Write the asynchronous data transfer format in serial communication. | 2 |
| 9 Compare among Direct, associative and set-associative address mapping techniques? | 3 |
| 10 What is meant by locality of reference and how does it help in faster execution of Programs? | 2 |

Part-B (5X10 = 50 Marks)

- | | |
|--|---|
| 11 (a) Derive an algorithm in flow chart form for the non restoring algorithm of fixed point binary Division with a numerical example? | 7 |
| (b) Define instruction set completeness? | 3 |
| 12 (a) Explain in detail about instruction cycle of general purpose computer with Fetch, Decode And execute. | 7 |
| (b) List out the registers in general purpose computer. | 3 |
| 13 (a) Describe bit manipulation instructions in the general purpose computer? | 5 |
| (b) Explain pipeline Conflicts and remedies? | 5 |
| 14 (a) Draw the block diagram of asynchronous communication interface and explain its Working operation. | 7 |
| (b) Write the applications of DMA controller. | 3 |
| 15 (a) Explain in detail about Cache memory organization. | 6 |
| (b) What are the replacement policies of Cache memory? | 4 |
| 16 (a) Draw the flow chart for a signed magnitude addition and subtraction algorithm. | 5 |
| (b) Explain the hardwired control unit of general purpose computer? | 5 |
| 17 Write short notes on any two of the following: | |
| (a) Flynn's Classification | 5 |
| (b) IOP | 5 |
| (c) Associative memory | 5 |

FACULTY OF ENGINEERING**B.E. 3/4 (ECE) II-Semester (CBCS)(Backlog) Examination, December 2019****Subject : Microprocessor and Microcontroller****Time : 3 Hours****Max. Marks: 75****Note: Answer all questions from Part-A & any five questions from Part-B.****PART-A (25M)**

- | | | |
|----|---|---|
| 1 | What is pipelining? How is this concept implemented? | 2 |
| 2 | Explain the concept of segmented memory? What are its advantages? | 3 |
| 3 | Differentiate between memory mapped I/O and I/O mapped I/O? | 3 |
| 4 | Distinguish between synchronous and asynchronous communication? | 2 |
| 5 | Explain the following pin functions with the help of an example.
i) MOV ii) MOVX iii) MOVC | 3 |
| 6 | Explain port3 Special Functional Register. | 2 |
| 7 | What is the function of each bit in SCON special functional register? | 3 |
| 8 | Explain RESET interrupt of 8051? | 2 |
| 9 | What is the purpose of \overline{EA} and $PSEN$ pins in 8051? | 2 |
| 10 | Give an 8051 based microcontroller system with 8KX8 EPROM and 8KX8 RAM? | 3 |

PART-B (5X10 =50 Marks)

- | | | |
|-------|---|---|
| 11 a) | Write the differences between minimum and maximum mode operation of 8086. Explain the functions of each pin of 8086 in the minimum mode operation. | 7 |
| b) | If the 8086 execution unit calculates effective address of 14a3h and DS contain 3000H, what physical address with the BIU produce. | 3 |
| 12 a) | Design a memory interface with the 8086 for the following specification.
(i) Two 16KB EPROMS ending at FFFFFH
(ii) Two 16KB SRAM starting from C0000H | 4 |
| b) | Draw and explain internal architecture of 8251 USART. | 6 |
| 13 a) | What are the SFRs of 8051? Explain with a programming model. | 5 |
| b) | Explain internal RAM organization of 8051. | 5 |
| 14 a) | Explain instruction set of 8051 with examples. | 5 |
| b) | Describe six interrupts in 8051 microcontroller. | 5 |
| 15 a) | Draw DAC interface to 8051 and write a program to generate sine wave. | 6 |
| b) | Explain Interrupt Enable register and Interrupt priority registers of 8051. | 4 |
| 16 a) | What is the use of assembler directives? Explain the 8086 assembler directives. | 5 |
| b) | Write a ALP to find the maximum number from a series of numbers using 8086 instructions. | 5 |
| 17 | Write short notes on any two of the following: (2x5=10) | |
| a) | Bit Manipulation Instructions of 8051. | |
| b) | Expansion of I/O port to 8051. | |
| c) | String instructions in 8086 | |

FACULTY OF ENGINEERING**B.E. 3/4 (Mech /AE) II - Semester (Backlog) Examination, December 2019****Subject: Heat Transfer****Time: 3 Hours****Max. Marks: 75****Note: Answer all questions from Part A and answer any five questions from Part B****PART – A (25 Marks)**

1. Explain the mechanisms of heat conduction in gases, liquids and solids. [3]
2. Define thermal diffusivity? What is its dimension? [2]
3. What is the physical significance of Biots number? Is the Biot number more likely to be large for highly conducting solids or poorly conducting ones? [3]
4. Define fin effectiveness. When is the use of fin not-justified? [2]
5. What do you mean by thermal boundary layer? How do the ratio $\frac{\partial}{\partial t}$ vary with prandtl number? [3]
6. Define local and mean heat transfer coefficients. On what factors do the value of h depends? [3]
7. Explain Kirchhoff's law of Radiation. What do you mean by the statement: A perfect absorber of radiant energy is also a perfect emitter? [2]
8. How does an enclosure with a small hole in it behave as a black body? [2]
9. What do you mean by fouling factor? What are the causes of fouling? [3]
10. Define effectiveness and NTU of a heat exchanger? [2]

PART – B (5 x 10 = 50 Marks)

11. A 1 mm diameter electrical wire is covered with a 2-mm thick layer of plastic insulation ($k=0.5 \text{ W/m K}$). The wire is surrounded by air with an ambient temperature of 25°C and $h=10 \text{ Wm}^2\text{K}$. The wire temperature is 100°C . Determine the rate of heat dissipated from the wire per unit length with and without insulation. Find the radius of insulation when the rate of heat dissipation is maximum. What is the maximum value of this heat dissipation? [10]
12. A copper sphere weighing 3 kg is heated in a furnace to a temperature of 300°C and is suddenly taken out and allowed to cool in ambient air at 25°C . It takes 60 min for the copper sphere to cool down to 35°C , what is the average surface heat transfer coefficient? Take density of copper $=8950 \text{ kg/m}^3$ and specific heat $C_p = 0.383 \text{ Kj/kg}^\circ\text{C}$. State the assumptions made and derive the relation used. [10]
13. A commercial aeroplane is modelled as a flat plate which is 1.5 m wide and 8 cm long in size. It is maintained at 20°C . The aeroplane is flying at a speed of 800 km/s in air at 0°C and 60 cm of Hg pressure. Calculate the heat loss from wing, if the flow is made to flow $\times 10^{-2} \text{ W/mK}$, $\nu=14.16 \times 10^{-6} \text{ m}^2/\text{sec}$. $Pr = 0.705$ [10]

14. A pipe carrying steam has an OD of 20cm and run in a large room. It is exposed to air to a temperature of 30°C. [10]
15. A process industry employs a counter-flow heat exchanger to cool 0.8 kg/s of oil ($C_p = 2.5 \text{ kJ/kgK}$) from 120°C to 40°C by the use of water entering at 20°C. The overall heat transfer coefficient is estimated to be 1600 W/m²K. It is assumed that the exit temperature of water will not exceed 80°C. Using NTU method and taking NTU = 4 in this case, calculate the following: [10]
- (i) Mass flow rate of water
 - (ii) Surface area required
 - (iii) Effectiveness of heat exchanger.
16. A long cylinder 12 cm in diameter and initially at 20°C is placed into a furnace at 820°C with the local heat transfer coefficient $h = 140 \text{ W/m}^2\text{K}$. Calculate the time required for the axis temperature to reach 800°C. Also calculate the corresponding temperature at a radius of 5.4 at that time. The physical properties of steel are $\alpha = 6.11 \times 10^{-6} \text{ m}^2/\text{h}$, $K=21 \text{ W/mK}$
17. (a) Explain the Boiling Heat transfer Phenomena, its types and applications. [4]
- (b) Determine the stable film boiling heat transfer coefficient for the film boiling of saturated water at atmospheric pressure on an electrically heated 1.5 mm dia horizontal platinum wire with temperature difference of 250°C. What would be the power dissipation per unit length of the heater. [6]

FACULTY OF ENGINEERING

B.E. 3/4 (PROD.) II-Semester (Backlog) Examination, December 2019

Subject: CAD / FEM

Time: 3 Hours

Max. Marks: 75

Note: Answer all questions from part-A and any FIVE questions from part-B

PART-A (25 Marks)

- 1 Explain the importance of geometric model in CAD.
- 2 Write short notes on B-Spline Curve.
- 3 Differentiate between a Plane, Ruled and Tabulated surfaces.
- 4 Enlist different kinds of transformations which are used for 2D transformations.
- 5 Write the shape functions for quadratic bar element.
- 6 Write the element stiffness matrix for Truss element.
- 7 Express the element load vector for uniformly distributed load on beam element.
- 8 Write the Strain displacement matrix of constant strain triangular element.
- 9 Express the material property matrix for axisymmetric element.
- 10 Write a short note on any FEA software and its features.

PART- B (50 Marks)

- 11 a) What do you understand by C_0 , C_1 and C_2 continuity conditions in curves?
b) Differentiate between Bezier and B-Spline curves.
- 12 Write the key characteristics of following analytical surfaces.
 - a. Planar surface
 - b. Surface of revolution
 - c. Tabulated cylinder surface.
- 13 a) What is rotation transformation? Write the rotation transformation matrix for different axis.
b) A line defined by two points A (1, 1), B (2, 4) is rotated by 30° . Determine the coordinates of transformed line.
- 14 For the truss shown in fig 1 calculate the nodal displacements and element stresses.
($E = 70 \text{ GPa}$. $A = 2 \text{ cm}^2$ for all truss members).

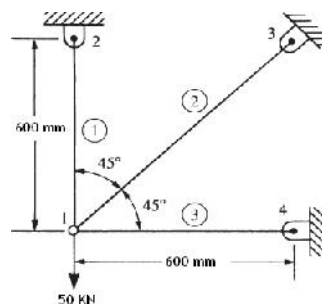


Figure - 1

-2-

15 Determine the deflection at the tip of the cantilever for the beam shown in fig2. Take $I=120 \times 10^{-6} \text{m}^4$, $E=200 \text{ GPa}$.

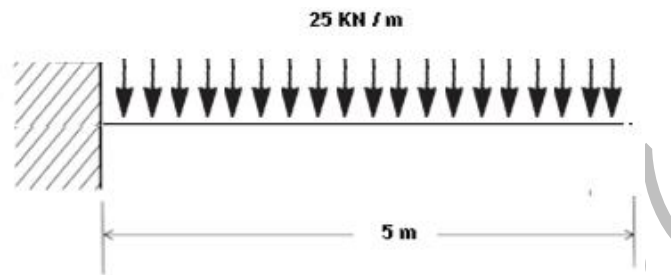


Figure - 2

16 For the isoparametric, quadrilateral element shown in figure3, determine the Jacobian matrix at $\eta = \frac{1}{4}$.

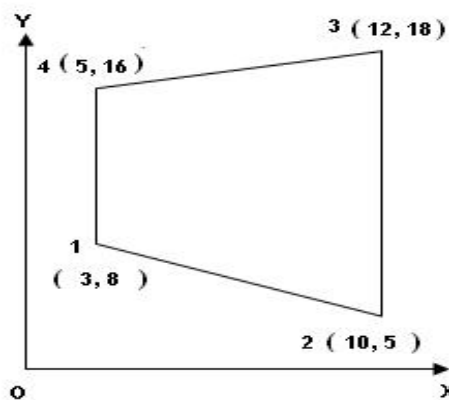


Figure - 3

17 Determine eigen values and eigen vectors for the following equation.

$$\begin{bmatrix} 3 & -3 \\ -3 & 3 \end{bmatrix} X = \lambda \begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix} X$$

FACULTY OF ENGINEERING**B.E. 3/4(CSE) II – Semester (Backlog) Examination, December 2019****Subject: Object Oriented System and Development****Time: 3 Hours****Max.Marks:75****Note: Answer all questions from Part A & any Five questions from Part B****PART – A (25 Marks)**

- | | | |
|----|--|---|
| 1 | Why do we Model? | 2 |
| 2 | What are four P's in object oriented development? | 2 |
| 3 | What are Extensibility Mechanisms? | 3 |
| 4 | What are Events? Describe different types of Events | 3 |
| 5 | Differentiate between Generalization and Realization | 3 |
| 6 | What are Core Workflows? | 3 |
| 7 | Compare Unit Testing with Integration Testing | 3 |
| 8 | Write about the purpose of Activity diagram | 2 |
| 9 | Define a Component. | 2 |
| 10 | Write notes on Types and Roles. | 2 |

PART-B (5X10 = 50 Marks)

- | | | |
|----|--|----|
| 11 | a) Discuss in detail about advanced relationships. | 6 |
| | b) Discuss in detail about advanced structural modeling. | 4 |
| 12 | a) Define Interaction diagrams. What are their contents and common properties? | 5 |
| | b) Define semantic equivalence between two kinds of interaction diagrams. | 5 |
| 13 | Differentiate component and deployment diagrams with neat diagrammatic examples? | 10 |
| 14 | Explain how the Unified process is an Architecture-Centric process | 10 |
| 15 | Explain the process of capturing requirements as use cases. | 10 |
| 16 | Write note on | |
| | a) Classifier | 4 |
| | b) Visibility | 3 |
| | c) Scope with examples | 3 |
| 17 | Discuss about the Analysis work flow in detail with suitable example | 10 |

FACULTY OF ENGINEERING**B.E. 3/4 (IT) II - Semester (Backlog) Examination, December 2019****Subject : Object Oriented System Development****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 aims of modeling? | 2 |
| 2 | What is the importance of a component in object oriented development? | 2 |
| 3 | What is the need for swim lanes? | 3 |
| 4 | What is an Artifact? | 3 |
| 5 | Explain pattern and framework with example. | 3 |
| 6 | What are core work flows? | 3 |
| 7 | What is unified process? | 3 |
| 8 | What are extensibility mechanisms? | 2 |
| 9 | Write about the role of design in software life cycle. | 2 |
| 10 | Which UML diagrams give static and dynamic types? | 2 |

PART – B (5 x 10 = 50 Marks)

- | | | |
|----|--|-------------|
| 11 | How do you model a class diagram using classes and all possible relationships? Explain with an example. | 10 |
| 12 | Explain in detail about the advanced relationships along with the stereotypes that may be applied for the relationships. | 10 |
| 13 | What is activity diagram? How does it differ from state chart diagram? | 10 |
| 14 | Explain in detail the implementation and test phase and core workflows carried out in them. | 10 |
| 15 | Describe the following :
a) Design workflow
b) Implementation workflow
c) Analysis workflow | 4
3
3 |
| 16 | Explain the process of capturing the requirements as use cases. | 10 |
| 17 | What are the steps involved in forward engineering? Explain. | 10 |
