FACULTY OF ENGINEERING

B.E. 4/4 (Civil) I-Semester (New) (Supplementary) Examination, May / June 2019

Subject : Foundation Engineering

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   Sketch the contact pressure distribution below flexible and rigid footings resting on clay.   2

2   The increment in vertical stress σ_z directly beneath a point load was found to be 450 kPa. Compute σ_z under the same load at a point (2, 1, 2).   3

3   Define Net ultimate bearing capacity.   2

4   Explain allowable pressure on footings.   2

5   Brief about over burden pressure correction to be applied on standard penetration number.   3

6   Using a drop hammer of 25 kN capacity and the height of drop being 5m, the average penetration over the last 6 blows was 12.5mm. Determine the allowable load on the pile using Engineering news formula.   3

7   When do you prefer a floating caisson?   2

8   Draw different shapes of wells.   3

9   Define inside and outside clearance of a sampling tube and mention their range.   3

10 To call a sample undisturbed, which properties of the soil are to be protected.   2

PART – B (50 Marks)

11 a) Compare Boussinesq's theory with Westergaard's theory and comment on the validity of these elastic theories in estimation of σ_z.   5

   b) A space between two concentric circles of dia 10m and 5m is loaded with UDL of 150 kPa at ground level. Find the vertical stress increase at the center of circles at a depth of 2m below ground level using Boussinesq's theory.   5

12 Derive the Terjaghi's bearing capacity equation for shallow foundations.   Also mention its assumptions and limitations.   10

13 a) Explain the procedure for separation of point bearing and skin frictional resistance of piles.   5

   b) Determine the safe load carrying capacity of a group of 15no. of 300mm sized square piles arranged in 3 x 5 pattern, installed to a depth of 9m in a pure clayey deposit. The properties of the clay include q_u = 120 kPa, α = 0.68.   5

14 a) Explain various types of cofferdams and the conditions in which each of them is ideal.   5

   b) Explain the process of sinking of well foundations.   5

..2

15 a) Enumerate the various methods of soil exploration and mention the circumstances under which each is best suited.   5
   b) Discuss the calculation of reactions in struts.   5

16 a) Write short notes on correction for construction period.   5
   b) Discuss in detail about single and multi under reamed piles.   5

17 a) Write the construction of pneumatic caissons.   5
   b) Discuss the methods of Dewatering.   5

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FACULTY OF ENGINEERING

B.E. 4/4 (EEE) I - Semester (Suppl.) Examination, May / June 2019

Subject : Electric Drives and Static Control

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

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

PART – A (25 Marks)

1 Draw a motor driving a hoist load in 1st and 2nd quadrants.   (3)

2 What are the components of load torques? Which of the components can be neglected?   (3)

3 What are the methods to reduce the energy during starting?   (2)

4 The slip of a 3-phase, 4 pole, 50 Hz induction motor at the instant of plugging is 1.96. Calculate its speed at motoring and slip at dynamic braking.   (3)

5 A separately excited dc motor is fed from a Type A, 200 V dc chopper, with duty ratio of 70%. Find the rms value of free-wheeling diode.   (3)

6 Draw Voltage vs. Flux of a dc drive for (i) constant power (ii) constant torque   (2)

7 Why Cyclo-converter fed induction motor normally operates at low speeds?   (2)

8 Draw approximate per phase equivalent circuit diagram of a 3-phase induction motor at a harmonic frequency.   (2)

9 What are the merits of self controlled synchronous motor over separate control?   (2)

10 Mention few industrial applications of switched reluctance motor.   (3)

PART – B (50 Marks)

11 (a) Explain steady-state stability of a drive system and derive the condition for the same.   (5)
    (b) Draw and explain how speed of a 3-phase induction motor can be controlled so that starting torque is equal to maximum torque in (i) forward motoring and (ii) reverse motoring in four quadrants.   (5)

12 (a) Describe how dynamic braking can be performed on a separately excited dc motor and draw its speed-torque characteristics.   (5)
    (b) Explain how energy loss of a dc shunt motor during starting can be computed at (i) no load and (ii) full load   (5)

13 (a) Draw and explain operation of a separately excited dc motor controlled by a 3-phase semi converter, assuming continuous conduction. Also derive an expression for output voltage. (7)

(b) The speed of a 50 kW, 500 V, 120 A, 1500 rpm separately excited dc motor is controlled by a 3-phase full converter fed from 400 V, 50 Hz supply. Find the firing angle to obtain a speed of (– 1000) rpm. (3)

14 (a) Discuss briefly operation of a VSI fed 3-phase induction motor. (5)

(b) A 3-phase, 415 V, 50 Hz, 1440 rpm star connected slip ring induction motor has the following per phase parameters referred to stator: $R1 = 0.12 \Omega$; $R2 = 0.1 \Omega$; $X1 = 0.4 \Omega$; $X2 = 0.4 \Omega$; $Xm = \infty$. Effective per phase turns ratio is unity. The speed control is by chopper controlled resistance in rotor circuit. For a speed of 1200 rpm, the inductor current is 100 A and chopper resistance is 1.8 Ω, calculate (i) chopper frequency and duty cycle (ii) rotor and stator currents and (iii) frequency of rotor current. (5)

15 (a) Discuss briefly the closed loop V/f control of a self controlled 3-phase synchronous motor. (5)

(b) A 5 kW, 3-phase, 440 V, ϕ50 Hz, 4 pole, u.p.f, delta connected synchronous motor has $Xs = 12 \Omega$ and negligible Rs. The motor is controlled by constant V/f ratio upto rated speed and constant terminal voltage above rated speed. Calculate armature current and power factor for 40% of rated torque and 2000 rpm. (5)

16 (a) Derive an expression for energy relation during starting and plugging of a dc shunt motor. (5)

(b) Using a neat circuit diagram and waveforms, explain the operation of a 1-phase Dual converter fed dc motor. (5)

17 Discuss any two of the following:
(a) Load equalization (5)
(b) Static Scherbius drive (5)
(c) Brushless dc motor (5)

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FACULTY OF ENGINEERING

B.E. 4/4 (ECE) I – Semester (New) (Suppl.) Examination, May / June 2019

Subject: VLSI Design

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 Compare enhancement and depletion modes of MOSFET.   (3)
2 Draw the CMOS circuit for the logic expression $f = \overline{a.(b+c)}$ (3)
3 What are Lambda based design rules.   (2)
4 Define delay in ICs.   (2)
5 Draw the circuit diagram of 3T DRAM cell.   (2)
6 Design D flip flop using transmission gates.   (3)
7 What cross talk is in interconnects?   (2)
8 Why are buffers inserted in long connecting wires?   (3)
9 What is a cascode amplifier?   (2)
10 Draw the circuit of a BJT current mirror. Give the expression for I_{out}.   (3)

PART – B (50 Marks)

11 a) What is Body effect. How does it influence the MOSFET operation?   (3)
    b) Draw the AOI logic gate diagram and CMOS circuit for the expression.

$$f = \overline{[(a.b) + (c.d)].e}$$ (7)

12 a) Calculate the resistance for nMOSFET with channel length $L = 8$ and width $W = 2$.
The sheet resistance of n- channel is $10^4 \, \Omega / m^2$.   (3)

    b) Draw the stick diagram and layout for a 2-input NAND gate.   (7)

13 a) Explain the design of a 4 X 1 MUX.   (5)
    b) Describe the operation of 6T SRAM cell.   (5)

14 a) What is the model to represent RC delay in interconnects in ICs. Derive the
       expression for the delay.   (7)
    b) How is inductance measured in interconnects.   (3)

15 a) Derive the expression for the voltage gain of a common source amplifier with current
       mirror load.   (5)
    b) How the output resistance can be increased using cascode current mirror. Derive
       the expression for r_{out}.   (5)

16 a) Design Ex – OR gate using transmission gates.   (4)
    b) Design NOR based ROM. Explain its operation.   (6)

17 Write short notes on: (10)
    a) Carry Select adder
    b) Inverter with different loads
    c) Dynamic register element.

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FACULTY OF ENGINEERING

B.E. 4/4 (ECE) I – Semester (Old) Examination, May / June 2019

Subject: VLSI Design

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

Part – A (25 Marks)

1. What are the compiler directives?	2
2. Different between data flow modeling and structural modeling.	3
3. How to design mealy model using verilog?	2
4. What is synthesis? Give Synthesis flow.	3
5. Draw V-I Characteristics of NMOS Transistor in Enhancement mode.	2
6. Differentiate between CMOS Technology and Bi-CMOS Technology	3
7. Draw the stick diagram of two inputs NOR gate.	2
8. Write steps to be followed to measure sheet resistance	3
9. Draw logic circuit of carry skip adder.	3
10. Draw the structure of NAND based ROM memory cell	2

Part – B (50 Marks)

11. a) What are the different types of delays in verilog and how they can be included in a HDL module Wave forms.   5

    b) List out various data types in verilog? Explain them in detail.   5

12. a) Develop a verilog code for 8 to 1 Multiplexer.   5

    b) What is Moore model? How it is different from mealy model. Write a verilog code for half adder using Moore model.   5

13. a) Design a 3 input XOR gate using CMOS logic.   5

    b) What is transmission gate logic? Design 4 to 1 MUX using transmission gate logic.   5

14. a) Draw the layout diagram of the function $F = \overline{A + B + C}$. Show all the layers   5

    b) How to calculate the delay of two input NAND gate? Explain with the help of logic circuit.   5

15. a) Design a 4bit carry select adder. Explain its operation with an example.   5

    b) Draw 4 bit barrel shifter. Describe its operation.   5

16. a) Differentiate between DRAM and SRAM   5

    b) Design a D flip-flop using transmission gate logic.   5

17. Write a short note on

    a) Electrical properties of MOS transistor   4

    b) Gate level Net list   3

    c) NOR based ROM cell   3

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FACULTY OF ENGINEERING
B.E 4/4 (M/P) I-Semester (Suppl.) Examination, May / June 2019

Subject: Metrology and Instrumentation

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 Differentiate between Dynamic Errors and Systemic Errors. (3)
2 What are the various types of Plug gauges? Sketch any two of them and state their specific applications. (3)
3 Explain the principle of pneumatic comparator with a neat sketch. (3)
4 Distinguish between Measuring instrument and a Gauge. (2)
5 What is Wringing? List few essential conditions of Wringing slip gauges. (2)
6 Explain the principle of GO and NO-GO gauges. (2)
7 What are proving ring strain gauge load cells? (3)
8 List the various elements of the Spur gear which are checked for the accuracy of the gear. (2)
9 Explain about Interchangeability. (2)
10 Explain Runout and Concentricity for inspection of gear. (3)

PART – B (5x10 = 50 Marks)

11 (a) Explain manufacture of slip gauges and calibration of slip gauges. (5)
   (b) Explain the working of Tomlinson gauges with neat sketch. (5)

12 (a) Sketch and describe the optical system of N.P.L flatness interferometer? And also explain the principle of measurement by light wave interference methods. (5)
   (b) Explain Coordinate Measuring Machine (CMM) and what are the geometric (GD&T) features included in CMM software, sketch each. (5)

13 (a) Explain the working of Parkinson gear tester. (5)
   (b) Derive the expression for measuring the effective diameter of screw thread by 3-wire method. (5)

14 (a) Sketch and explain the principle and working of LVDT displacement transducer. (5)
   (b) Define the gauge factor of a strain gauge and derive the expression. (5)

15 Explain the measurement of pressure, using different elastic transducer elements? State and discuss the laws of thermoelectricity. (10)

16 (a) Explain the principles of thread gauging. (5)
   (b) Distinguish between basic hole and shaft system. (5)

17 Write short notes on any Two of the following : (10)
   (a) Back Pressure type Pneumatic Comparator.
   (b) Piezo electric load cell.
   (c) Rosette gauge with neat sketch

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FACULTY OF ENGINEERING
B.E. 4/4 (CSE) I-Semester (Suppl.) 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 Differentiate between Intelligence and Artificial Intelligence   2

2 Define the problem as state space search problem and prove water jug problem   3

3 What do you mean by knowledge representation   2

4 Define resolution for predicate calculus.   3

5 Represent in propositional calculus the knowledge contained in the following
   sentence: "If cruise ships only go on big rivers and go on the ganges, then ganges is a
   big river"   3

6 Illustrate a two-layer feed-forward network with two inputs, two hidden modes and
   one output mode.   2

7 Describe information gain in a decision tree   2

8 What is fluent in situation calculus   3

9 Name any two speech acts   2

10 Differentiate between a crisp set and a fuzzy set. Define membership function in
   fuzzy system   3

PART-B (5x10 = 50 Marks)

11 Tony, Mike, and John belong to the Alpine Club. Every member of the Alpine Club is
   either a skier or a mountain climber or both. No mountain climber likes rain, and all
   skiers like snow. Mike dislikes whatever Tony likes and likes whatever Tony dislikes.
   Tony dislikes rain and snow.
   Use resolution refutation to prove that "Is there a member of the alpine club who is a
   skier but not a mountain climber?"   10

12 (a) Discuss any two applications of artificial intelligence 5

(b) Consider the game tree given in figure.1, in which the root corresponds to a MAX node and the values of a static evaluation function, if applied, are given at the leaves. 5
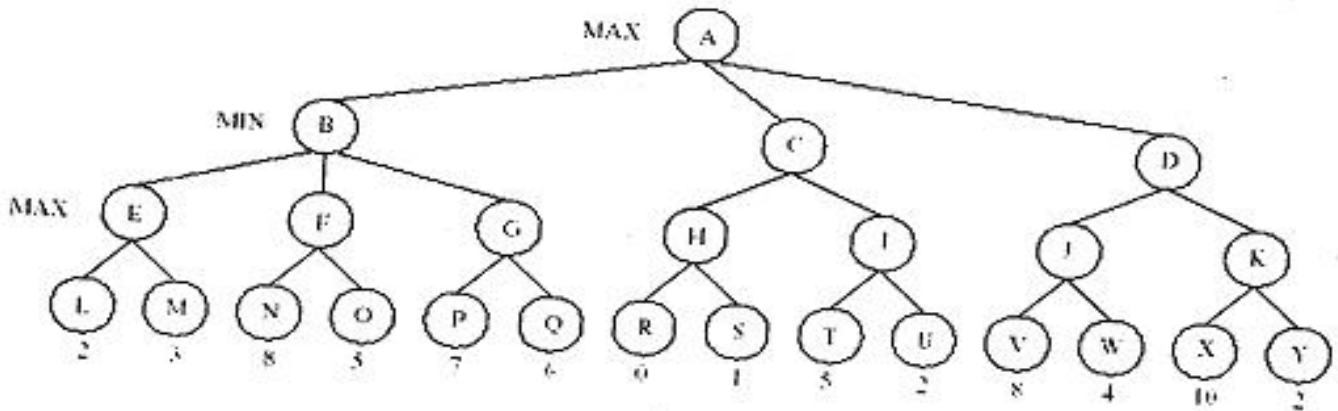

Fig.1: Game Tree

What is the minimax value computed at the root node for this tree? What move should MAX choose? Show all intermediate values at each node as they get updated.

13 List the components of STRIPS operator? Give an illustration of how forward search method proceeds by applying recursive STRIPS. Draw a search graph generated by applying one operator. 10

14 What is an expert system? Explain the main components of an expert system 10

13 Explain the importance of Natural Language Processing? Enumerate the various phases in NLP 10

16 (a) Define Entropy. 2

(b) Assume a domain with three attributes A, B, and C. Each attribute has two possible values T and F. Given below is a set of instances.

A	B	C	Target
T	T	T	Yes
T	T	F	NO
T	F	T	Yes
F	T	T	Yes
F	T	F	NO
F	F	F	Yes

Calculate the information gain for the attributes A, B and C. Which attribute would be selected by the standard ID3 algorithm. 8

17 (a) What is a neural network? What are its different layers? 5

(b) Explain briefly about Fuzzy Inference. 5

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FACULTY OF ENGINEERING
B.E. (I.T.) 4/4 I - Semester (New)(Suppl.) Examination, May / June 2019

Subject : VLSI Design

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 is Moore's law?	(2)
2 Draw the stick diagram of NOT gate.	(3)
3 What are blocking and non blocking statements in verilog?	(3)
4 Explain scaling concept of MOSFET.	(2)
5 Describe threshold voltage in MOSFET.	(2)
6 Design Y=A(B+C) using CMOS logic.	(3)
7 Explain charge leakage in clocked CMOS logic.	(2)
8 Describe fanout and input capacitance in CMOS inverter.	(3)
9 Define pass transistor logic.	(2)
10 Explain multiple rung ladder network.	(3)

PART – B (50 Marks)

11 (a) Draw transmission gate using 4x1 mux.	(5)
(b) Draw RC model of FET with MOS capacitances.	(5)
12 Explain the fabrication of CMOS process.	(10)
13 (a) Draw the layout of transmission gate and non inverting buffer.	(7)
(b) Draw the RC switch model of CMOS inverter.	(3)
14 (a) Explain read and write operation of 4T SRAM.	(7)
(b) Explain IT dynamic RAM.	(3)
15 (a) Explain different kinds of modelling techniques in verilog.	(7)
(b) Explain master slave D flipflop operation.	(3)
16 (a) Design complementary pass Transistor logic using AND/NAND gates.	(5)
(b) Describe rise time and fall time in CMOS inverter.	(5)
17 Write short notes on:	
(a) latch up condition	(5)
(b) Crosstalk	(5)

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FACULTY OF ENGINEERING
B.E. (I.T.) 4/4 I - Semester (Old) Examination, May / June 2019

Subject : VLSI Design

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

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

PART – A (25 Marks)

1 Explain how a MOSFET works as a switch. (3)
2 Explain the operation of transmission gate logic. (3)
3 Draw the CMOS diagram of xor gate. (2)
4 Write about the layers used to create MOSFET. (2)
5 Write in brief about the stick diagrams? (3)
6 Explain Cell concepts briefly. (2)
7 Explain with a diagram Tri State circuit. (3)
8 What is propagation delay and write the expression for the same. (3)
9 Write the verilog code of half adder. (2)
10 Write in brief about testing. (2)

PART – B (50 Marks)

11 (a) Illustrate bubble pushing using De Morgan's Law. (5)
     (b) Draw the CMOS diagram of XOR and XNOR logic gate and explain with
        a truth table. (5)

12 (a) Draw the layout of three input NAND. (5)
     (b) Write about photolithography. (5)

13 (a) Draw the DC characteristics of CMOS inverter and find the midpoint voltage. (4)
     (b) With a neat diagram explain CMOS process flow for fabrication. (6)

14 (a) Explain read and write operation of DRAM cell. (5)
     (b) Write about effect of charge storage on floating gate. (5)

15 (a) What is an interconnect? Derive the delay modeling of an interconnect. (5)
     (b) Write the verilog code for full adder. (5)

16 (a) Design a 4 bit barrel shifter. (5)
     (b) Write about multipliers. (5)

17 (a) Design an 8:1 MUX using 2:1MUX transmission gates. (5)
     (b) Write about RTL and Behavioral modelling. (5)

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FACULTY OF ENGINEERING
B.E. (Civil) VI – Semester (CBCS) (Main) Examination, April / May 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   Define influence line diagram and write the uses of the influence line diagram.

2   An U.D.I of intensity 20 kN/m and length 5 m, crosses a simply supported girder of span 20 m calculate the EUDELL.

3   Draw the influence line diagram for the force in the bottom chord member of 3rd panel in the 6 panelled warren truss.

4   Calculate the length of suspension cable of span 100 m and central dip of 4 m supports of the cable are at the same level.

5   Define flexibility coefficient and write the properties of flexibility coefficient matrix.

6   Determine the flexibility matrix for a fixed beam by treating the end moments as redundant.

7   Define kinematic indeterminacy. The kinematic indeterminacy of a fixed beam is _____.

8   Develop the stiffness matrix for the beam shown in Fig. 1.

Fig. 1
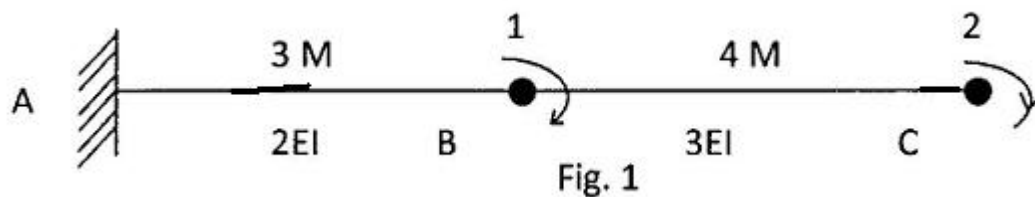
9   Name two software used in the field of structural analysis.

10 Develop the stiffness matrix for 2 noded beam elements with 3 Degrees of freedom at each node.

PART – B (5x10 = 50 Marks)

11 An uniformly distributed load of intensity of 15 kN/m of length 6 m crosses a simply supported girder of span 20 m. Find the maximum bending moment and shear force at a section 5 m from the right support. Also determine the absolute maximum bending moment and shear force in the girder.

12 The wheel loads shown in Fig. 2 roll over a beam of span 15 m. Find the maximum bending moment @ 5m section from the left end. Also, determine the position and magnitude of absolute maximum B.M. in the girder.

Fig. 2
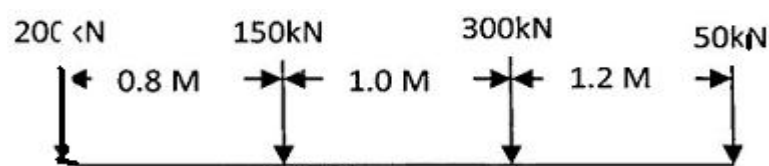
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13 Construct the influence line diagram for forces in the members U_1U_2, L_1,L_2 for the truss shown in Fig. 3. Hence calculate the forces in these members due to a dead load of 20 kN/m and moving live load of 30 kN/m which is longer than the span. Take each panel 6 m width each, members U_1L_1 = 3m and U_2L_2 = 5m.
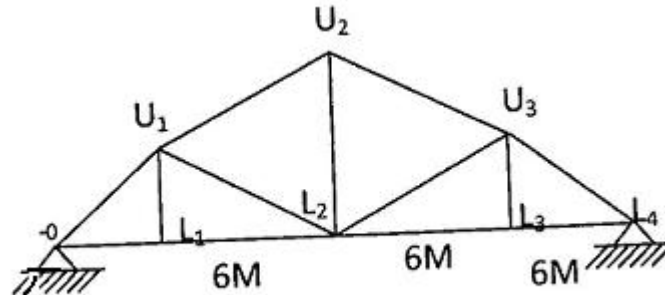

Fig. 3

14 A suspension bridge of 100 m span has a three hinged stiffening girder supported by cables having a central dip of 10 m. The left half of the span of the bridge is loaded with uniformly distributed load of intensity 25 kN/m. Determine the reactions and draw the bending moment and shear force diagram for the stiffening girder.

15 Analyse the beam shown in Fig. 4 using flexibility method and draw the BMD. Assume EI is the same for all the members.
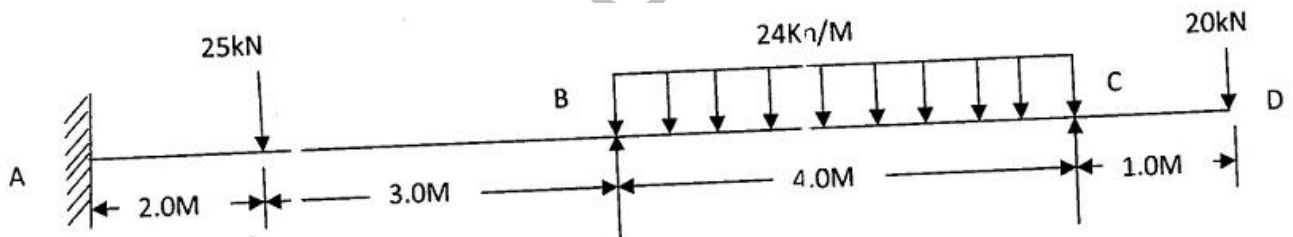

Fig. 4

16 Analyze the plane truss shown in Fig. 5 using stiffness matrix approach.
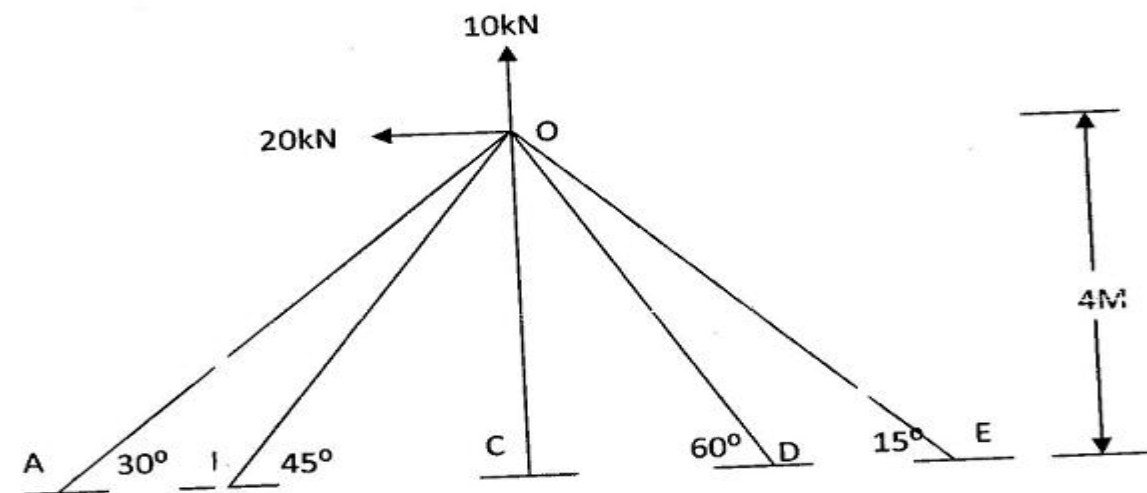

Fig .5

..3

17 Analyze the following continuous beam shown in Fig. 6 by either flexibility or stiffness method if the support 'B' sinks down by 10mm. Take E = 200 GPa and I = 1.35×10^{-3} m^4. Also draw BMD.
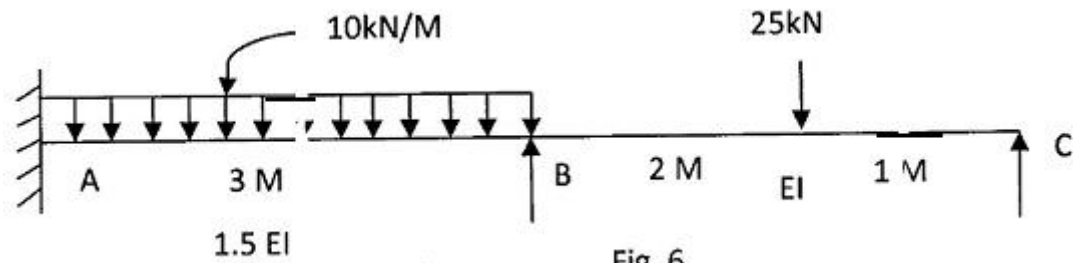

Fig .6

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FACULTY OF ENGINEERING

B.E. VI – Semester (CBCS) (EEE) (Main) Examination, May / June 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 (10 x 2 = 20 Marks)

1.	Distinguish between primary and back up protection	(2)
2.	What is universal relay torque equation?	(2)
3.	Draw the block diagram of microprocessor based over current relays	(2)
4.	Define the terms	(2)
	a) Recovery voltage	
	b) Restriking voltage.	
5.	What are the causes and effects of over voltages	(2)
6.	Give a brief note about the Auto Reclosure	(2)
7.	What is magnetizing inrush current?	(2)
8.	The symmetrical breaking capacity of a circuit breaker is x MVA, find its making capacity value	(2)
9.	Write the differences between Amplitude comparator and phase comparator	(2)
10.	An over current relay of rating of 5 A and setting 150% is connected to the secondary of a CT of ratio 400/5 and the relay fault current is 30 A. Calculate the current in the line for which the relay picks up.	(2)

PART – B (10 x 5 = 50 Marks)

11.	a) Explain about generator transformer unit protection	(3)
	b) With a neat diagram explain the construction and working of Stator Inter Turn Protection scheme	(7)
12.	a) Give a brief note about the duality between Amplitude comparator and phase comparator	(6)
	b) Mention the types of Phase comparators	(4)
13.	a) With a neat sketch explain the construction and working principle of induction type directional relay. Also plot its V-I characteristic.	(7)
	b) Draw one line diagram of power system network to illustrate different protective zones of system.	(3)
14.	a) Explain how the arc is initiated in circuit breakers	(2)
	b) Derive an expression for Restriking voltage and Rate of Rise of Restriking Voltage of a circuit breaker	(8)

15. a) Describe the construction and principle of operation of operation of valve type lightning arrester (3)

b) What is a ground wire? How do ground wires protect the over head lines against direct lightning strokes (7)

16. a) Explain with a neat sketch the construction and working of SF_6 Circuit Breaker (5)

b) In a system of 132KV, 3 phase, 50 Hz, The circuit phase to ground capacitance is 0.01 µF, The inductance is 6 Henry. Calculate (5)

   i) The poles of a CB if a magnetising current of 10 Amps (Instantaneous value) is interrupted. And also calculate

   ii) The value of resistance to be used across the contacts to eliminate the restriking voltage

17. Write short notes on

   a) Protective scheme for the Parallel feeder System. (4)

   b) Peterson coil (3)

   c) Buchholz Relay (3)

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FACULTY OF ENGINEERING
B.E. VI – Semester (CBCS)(Inst.)(Main) Examination, May / June 2019

Subject: Process Control

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. What is Thermal Element Lag?   2
2. Explain the term Process Degree of Freedom.   2
3. What is an Anticipatory Controller Mode?   2
4. Explain the function of Two Position Floating Controller.   2
5. What is meant by Tunning of controller?   2
6. What is an Electrical Actuator?   2
7. Explain the function of Pneumatic Actuator.   2
8. Elaborate the selection of Control valve.   2
9. With a neat diagram explain the Relay controller.   2
10. Draw the Basic structure of PLC.   2

PART – B (5 x 10 = 50 Marks)

11. a) With a Schematic Diagram explain Flow Process.   5

     b) A Triangular Wire has an equation $q = C_v\sqrt{2gh^5}$ Calculate the Resistance.   5

12. a) Explain PD Controller with analytic expression.   5
     b) With a Schematics diagram explain Single Speed Floating Control.   5

13. a) Explain Static error, Offset error and Velocity error.   5
     b) In the application of Ziegler Nichols method oscillations are observed in the process with proportional band set to 400/01 in the time period of 10 minutes. Find the setting of Three Controller mode?   5

14. a) Explain Control Valve Sizing and Selection.   5
     b) With a neat PLC Software with an example.   5

15. a) With a neat diagram explain PLC operations.   5
     b) Explain the PLC Software with an example.   5

16. a) Draw the Ladder Diagram for the following function when PBI is pressed the Red light turns On, when PB2 is pressed neither of the light turns ON.   5
     b) With a neat diagram explain Pneumatic Valve Positioner.   5

17. Write short notes on
     a) Liquid Process   4
     b) Automatic Controller   3
     c) Integral control mode   3

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FACULTY OF ENGINEERING

B.E. (ECE) VI – Semester (CBCS) (Main) Examination, May / June 2019

Subject: Antennas and Wave Propagation

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

Note*:* Answer all questions from Part-A, & any Five questions from Part-B.

PART – A (20 Marks)

1. Distinguish between far field and near field of an antenna.   2
2. Define antenna radiation pattern. Draw and explain its parameters.   2
3. List some applications of a Helical antenna.   2
4. State secant law.   2
5. Write the excitation coefficients of 5 element binomial array.   2
6. Compare broadside and endfire arrays.   2
7. What is the E-plane metal plate lens?   2
8. Define line of sight propagation.   2
9. Differentiate V antenna from Rhombic antenna.   2
10. Define parasitic array.   2

PART – B (50 Marks)

11. (a) What is Lorentz gauge condition? Show that   8

$$\frac{\nabla \nabla \cdot \overline{A}}{j\omega\mu\varepsilon} - j\omega\overline{A} = \frac{1}{j\omega\mu\varepsilon}\left(\nabla \times \nabla \times \overline{A}\right)$$

Where $\overline{A}$ is magnetic vector potential.

   (b) At what distance induction and radiation field are equal?   2

12. What is the Hertzian dipole? Obtain expressions for the radiation fields of it.   10

13. Explain about working principle of

   (i) Parabolic antenna

   (ii) Horn antenna   10

14.(a) Explain in detail the different cases of the array containing two isotropic sources.   8

   (b) Discuss the principle of pattern multiplication.   2

15 (a) Give the structure of ionosphere and explain the mechanism of sky wave
   propagation.   6

   (b) Describe any one method to measure the gain of an antenna.   4

16.(a) Explain the cassegrain feeding of paraboloid reflector and its advantages.   5

   (b) Obtain the maximum effective aperture of short dipole antenna   5

17. Write a short note on   10

   a) Friss transmission formula   5

   b) Effect of earth on vertical patterns   5

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FACULTY OF ENGINEERING

BE VI – Semester (CBCS) (Mech.)(Main) Examination, May / June 2019
Subject: Hydraulic Machinery & Systems

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. How do you classify Hydraulic machinery?   [2]

2. Define the impact of jet?   [2]

3. A single acting reciprocating pump running at 100 rpm delivers 12 lit / sec water. The diameter and stroke of the cylinder are 20 cm and 30 cm respectively find the coefficient of discharge of pump?   [2]

4. Draw performance curves of Reciprocating pumps.   [2]

5. What is the significance of priming in centrifugal pump?   [2]

6. Define specific speed of Centrifugal pump?   [2]

7. Differentiate between Inward and Outward radial flow reaction turbine?   [2]

8. State type of turbine used, if the head is 150 meters to develop 1500KW, while running at 300 rpm is?   [2]

9. What are the specifications of the D.C valve?   [2]

10. Write the basic components of hydraulic circuits?   [2]

PART – B (5 x 10 = 50 Marks)

11. A jet of water of 5 cm diameter impinges on a curved vane and deflected through an angle of 175 deg the vane moves in the same direction as that of jet with a velocity of jet 35 m/s .if the rate of flow is 170 L/sec. determine the component force on the vane in the directional motion. How much would be power developed what would be the vane efficiency?   [10]

12. Obtain an expression for the force exerted by a jet of water on moving inclined plate in the direction of jet.   [10]

13. The cylinder bore diameter of a single acting reciprocating pump is 120mm and its stroke is 300mm.Thepump runs at 70 r.p.m and lifts water through a height of 25m.The delivery pipe is 22m long and 90mm in diameter. Find the acceleration head at the beginning and middle of the delivery stroke.   [10]

14. With help of neat sketch explain the working of Double acting Reciprocating pump?   [10]

15. a) With help of neat sketch explain the working of centrifugal pump? [4]

b) Centrifugal pump runs at 800 rpm and delivers 5cubic meters per sec against a head of 7 m, the impeller has an outer diameter of 25cm and width of 5cm at out let if the vane angle at the out let is 50 degrees determine

1) manometric efficiency,

2) specific speed [6]

16. For a Kaplan turbine with a runner diameter 4meter the discharge is 60 cubic meters/sec and the hydraulic and mechanical efficiencies 90% and 94% resp. The diameter of boss is 0.3 times the runner diameter and speed ratio is 2.0. Assuming that discharge is free and there is no whirl at outlet, calculate the net available head on the turbine and specific speed. [10]

17. Write short notes on the following

a) Explain working principle of external pumps

b) Working of various servo systems? [5+5]

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FACULTY OF ENGINEERING
B.E VI – Semester (CBCS) (Mech.)(Main) Examination, May / June 2019

Subject: Modern Machining & Forming Methods - (Elective – I)

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. What are the functions of liquid medium in slurry used in USM?
2. Write at least two advantages and two limitations of AJM.
3. Mention the desired properties of dielectric medium used in EDM.
4. What are the advantages of hot machining?
5. What are various sources of laser?
6. State the advantages of electron beam machining process.
7. Explain the principle of Rubber pad forming.
8. What is the effect of standoff distance in explosive forming?
9. Differentiate between compression and radial draw forming.
10. Sketch the principle of water hammer forming.

PART – B (5 x10 = 50 Marks)

11. a) How unconventional forming methods have been classified?
　　b) Explain the effect of the following process parameters on material removal rate and surface finish in USM.
　　　i) Amplitude and frequency of vibration
　　　ii) Abrasive grit size and
　　　iii) Static load

12. a) What are the functions of electrolyte? What are the factors need to be considered while selecting it?
　　b) Explain the principle and working of wire EDM process with a neat sketch.

13. a) Explain the principle and working of laser beam machining. Give limitations and applications.
　　b) Explain what is meant by transferred and non-transferred mode of plasma arc. What are the advantages of each process?

14. a) What do you understand by 'HERF'? Write the advantages and applications of HERF.
　　b) Explain with a neat sketch the principle and working of hydro forming process. List its advantages and applications.

15. a) Differentiate between stretch draw forming and rotary stretch forming.
　　b) Explain the methods of tube spinning technique.

16. a) Describe with the help of a neat sketch, the constructional features of an electron gun used in EBM process
　　b) Explain the principle of electro-hydraulic forming with a simple sketch. How does it differ from explosive forming?

17. Write short notes on:
　　i) Types of transducers used in USM
　　ii) High speed machining
　　iii) Water hammer forming

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FACULTY OF ENGINEERING

BE VI – Semester (CBCS) (A.E) (Main) Examination, May/ June 2019

Subject: COMPUTER AIDED DESIGN ANALYSIS & MANUFACTURING

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 meant by Turnkey CAD/CAM system?
2) What are properties of Splines?
3) Differentiate wire-frame, surface and solid modelling.
4) Write transformation matrices for rotation and scaling.
5) Write note on Mass property calculations.
6) What is finite element modelling?
7) Define canned cycle in CNC programming.
8) Explain tool length compensation.
9) Sketch polar configuration of robot.
10)   What are the advantages of rapid prototyping?

PART – B (50 Marks)

11. (a) Explain with neat sketch role of CAD/CAM in product life cycle.

  (b) What are the characteristics of B-spline curves? Explain with sketches?

12. (a) Explain surface modeling through analytic surface and enumerate their advantages.
  (b) Rotate the rectangle (0,0), (2,0),(2,2) and (0,2) shown in fig.1 30^0 CCW about its

   centroid and find new coordinate of rectangle.

(0,2)   (2,2)

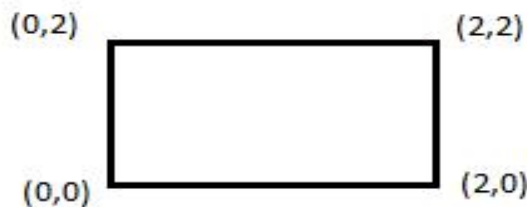(0,0)   (2,0)

Fig.1

13. Explain PDES format and their applications.
14. Describe the various features and elements of NC and CNC.

15. (a) Explain SCARA Robot configuration.

(b) What is CAQC? Explain various methods of CAQC.

16. (a) What are the advantages of parametric representation of entities?
  (b) What are principal functions of production planning and control?

17. Write short note on following.

   a) NURBS curves.
   b) FMS.
   c) Adaptive control system.

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FACULTY OF ENGINEERING

B.E. VI – Semester (CBCS) (CSE) (Main) Examination, May / June 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 (2 x 10 = 20 Marks)

1) Define Web Server List out various Web Server operations.

2) Write html code to create a link for other section within the same page.

3) List out the differences between html and xml.

4) Explain the purposes of XML Processors.

5) Write a JavaScript code for ONFOCUS event.

6) List out various Data types supported in python.

7) What is the difference between Servlet Context and Servlet Config objects?

8) List out JSP implicit Objects.

9) Is multiple Inheritance is supported in PHP ? Justify your Answer.

10) What is persistent **cookie**?

Part – B (5 x 10 = 50 Marks)

11. a) What is HTTP and Explain Http Request and Response Formats?   5M

    b) Write short note on the following tags.   5M

      < img >, < table >, < frameset >, < pre >

12. a) What is the use of XML namespaces? Explain in detail with an example?   5M

    b) Why XSLT is important for XML?   5M

13. a) Write a java script code to find sum of n even numbers? Read the value of n from user?   6M

    b) What is AJAX? List out various security issues with AJAX?   4M

14. a) Define a Session. Explain Different Session handling Mechanisms in web applications.   6M

    b) Explain Different Types of JSP Directives in detail.   4M

15. a) What is Servlet chaining?   4M

    b) Write a jsp program to accept two values from the user using forms and display the sum to user?   6M

16. a) Develop PHP page for validating username and password?   6M

    b) Explain about pattern matching in PHP.   4M

17. a) What are the key features of python?   3M

    b) Difference between JavaScript and Ajax?   3M

    c) Write a note on PHP files?   4M

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FACULTY OF ENGINEERING

B. E.VI – Semester (CBCS)(IT)(Main) Examination, May / June 2019

Subject: Compiler Construction

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. Define Bootstrapping and porting   2
2. What is the role of a Lexical Analyzer in a compiler.   2
3. List the major data structures in a compiler   2
4. Define ambiguity with an example   2
5. Define Bottom-up parsing.   2
6. Write the three address code for the following expression: 2
    a + a x (b – c) + (b – c) x d
7. Write the applications of Syntax directed translations   2
8. Write short notes on heap management   2
9. What is the role of symbol table.   2
10. Define peephole optimization   2

PART – B (5 x 10 = 50 Marks)

11. Explain the Compiler Translation process with an example.   10
12. (a) Find the FIRST and FOLLOW from the grammar given below: 5

$$S \rightarrow AaBD$$
$$A \rightarrow c \mid v$$
$$B \rightarrow b \mid v$$
$$D \rightarrow d \mid v$$

(b) Explain Recursive Descent Parsing technique with an example   5

13. Construct SLR(1) parsing table for the grammar given below: 10

$$S \rightarrow dA \mid aB$$
$$A \rightarrow bA \mid c$$
$$B \rightarrow bB \mid c$$

14 (a)Explain code generation for control statements and Logic   3

Expressions.

(b) Write three Address code for the following

Function Definition : int f (int x, int y)

{ return x + y + 1}

Function call : f(2 + 3, 4)

15   (a)Write briefly about memory organization during program   5
execution

(b)Explain Stack-based runtime environments.   5

16   (a) Generate the three address code and p-code for the   5
              following control statements:

              i) If (E)S1 else S2

            ii) While(E)S

      (b) Explain briefly about various code optimization   5

        techniques

17   Write short notes on the following:

    (a) Type checking   3

    (b) YACC   3

    (c) Data structures supported by symbol table   4

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