FACULTY OF ENGINEERING

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

Subject: Structural Engineering Design and Detailing – I (Concrete)

Time: 3 Hours   Max. Marks: 75

Note: Answer all questions from Part A and any One question from each unit

PART –A (25 Marks)

1 State the conditions in which trapezoidal footing is preferred.
2 What are the stability requirements for retaining wall?
3 Describe location of critical section for maximum bending moment, one way shear and two way shear in design of footing.
4 Explain the various parts and behavior of a cantilever retaining wall.
5 List the forces in design of top dome of intz tank.
6 Why the permissible stresses in concrete and steel are less in IS 3370 when compared with IS 456.
7 Explain various kinds of joints used in water tanks.
8 List the conditions to be satisfied for using courbon's method.
9 Define Bridge deck.
10 Write a note on impact factors for bridges.

PART – B (50 Marks)

Unit-I   **(15 marks)**

11 Design a combined rectangular footing connecting two columns A and B of same size 500mm x 500mm and load carrying capacity 1000 kN. The centre to centre spacing of column is 4m. The SBC of soil is 180 KN/m^3. Use M_{20} concrete and Fe 415 steel. Sketch the reinforcement details.

(OR)

12 Design a counter fort type retaining wall for the following data.
   (a) Height of the wall above ground level = 5.5m
   (b) SBC of soil = 180KN/ m^2
   (c) Angle of repose = 30^0
   (d) Weight of soil =16KN/m^3
   (e) Spacing of counter forts = 3m c/c
   (f) Coefficient of friction = 0.45
   Use M_{20} concrete and Fe 415 steel. Sketch the reinforcement details.

Unit – II   **(15 marks)**

13 Design a circular tank resting on ground to hold 200000 liters of water. The depth of water is restricted to 5 m .The joint between wall and tank is rigid. Use M_{25} concrete and Fe 500 steel. Sketch the reinforcement details.

(OR)

14 Design the following components of intz tank of capacity 250000 liters of water symmetrically placed on 8 columns. Use M_{25} concrete and Fe 500 steel.
   (a) Top dome
   (b) Top ring beam
   (c) Bottom ring beam

….2

(20 marks)

15 Design a deck slab bridge for the following data.
  (a) Carriage way = 6.8 m
  (b) Clear span = 5.5 m
  (c) Wearing coat = 80mm
  (d) Live load = IRC class 'A' loading
  (e) Width of footpath = 600mm on either side
      Use M_{20} concrete and Fe 500 steel. Sketch the reinforcement
      details in L/S and C/S

(OR)

16 Design the reinforced concrete slab of a reinforced concrete T-
   beam bridge to suit the following data.
   (a) Span of T- beams = 16m
   (b) Spacing of main T- beams =2.5m
   (c) Spacing of cross girders= 4m
   (d) Live load = IRC class 'AA' tracked vehicle
   (e) Material = M_{25} concrete and Fe 500 steel.

   Sketch a neat diagram of slab along with reinforcement details.

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FACULTY OF ENGINEERING

B.E. (EE/Inst.) VI - Semester (CBCS) (Suppl.) Examination, December 2019

Subject : Microprocessors and Microcontrollers

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 Name the conditional flags of 8086 microprocessor.
2 Indicate the addressing modes of the following instruction :
   a) MOV DL, AFh
   b) MOV CL, [BX].
3 What is meant by 'Procedure' in assembler programming?
4 What is the difference between assembly language and machine language?
5 What is an interrupt in 8086?
6 What are the steps in interfacing peripherals with the microprocessor?
7 What is the status of all registers on reset in 8051?
8 How much maximum external program memory can be interfaced with 8051?
9 Mention the addressing modes of 8051 microcontroller.
10 Discuss the difference between the instructions *MOV A*, *05H* and *MOV A*, *#05H*.

PART – B (5 x 10 = 50 Marks)

11 Explain the architecture of 8086 microprocessor with help of a neat schematic.   10

12 With an example, explain the following 8086 instructions :   10
   a) POP   b) CMP   c) JNZ   d) NOT   e) SHR

13 a) Write 8086 Assembly Language Program to multiply two 16-bit numbers.   6
   b) Explain the following 8086 Directives   4
      i) ENDM   ii) SHORT

14 Draw the internal architecture of 8255 and explain its different modes in detail.   10

15 Draw the pin diagram of 8051 micro controller and explain each pin function in detail.
                                                                                            10

16 With examples, explain the typical instruction set of 8051 microcontroller.   10

17 Write an assembly language program for averaging two numbers in 8051.   10

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FACULTY OF ENGINEERING
B.E. (ECE) VI-Semester (CBCS)(Suppl.) Examination, December 2019

Subject : Microprocessor and Microcontrollers

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 the function of TF flag in 8086?
2 Explain the following ring of 8086 .
   (A) WAIT (B) $\overline{BHE}$
3 Explain the following instructions if 8086 : (A) LEA (B) STD
4 Write an ALP to set and reset PC_6 of 8255 in BSR mode.
5 Explain bit addressable features of 8051.
6 Describe the function of each bit in SCON register.
7 Explain the following instructions with an example
   (i) SWAP (ii) XCH (iii) MUL (iv) DJNZ
8 Write the priorities of interrupts in 8051.
9 Differentiate between Unipolar, bipolar and universal stepper motors.
10 Draw interfacing circuit of DAC to 8051 microcontroller.

Part – B (5 X 10 = 50M)

11 (a) Write the differences between minimum and maximum mode of operation and
      explain minimum mode signals of 8086. 5
   (b) List different program memory addressing modes with suitable examples. 5

12 (a) Explain physical memory organisation of 8086 system. 5
   (b) Explain 8255 internal block diagram with a neat diagram. 5

13 (a) Explain architecture of 8051 with a neat diagram. 5
   (b) Explain the following instruction/ function with example. 5
      (i) CJNE (ii) DJNZ (iii) JZ (iv) SWAP A (v) XCH

14 (a) Explain Timer/Counter operation in 8051. What is the role of TMOD and
      TCON register in Timer/Counter operation? 5
   (b) Draw the structure of interrupt enable and interrupt priority registers. Write
      the Function of each bit. 5

15 (a) Explain about the interfacing of 8255 to 8051 with a neat diagram 3
   (b) Write a program to read data from ADC into 8051. Show the interfacing
      diagram. 7

16 (a) Write an assembly language program to convert BCD to binary using 8086
      Instruction set. 5
   (b) Describe the string instructions of 8086 with an example. 5

17 (a) Write an 8086 ALP to find a square of a BCD number using XLAT Instruction? 3
   (b) Explain RAM organisation of 8051. 3
   (c) Explain LCD interface to 8051 operation with a neat diagram 4

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FACULTY OF ENGINEERING

B. E. VI Semester (CBCS)(M/P)(Supple.) Examination, December 2019

Subject: Refrigeration & Air Conditioning

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

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

PART - A (20 Marks)

1	What are eco friendly refrigerants?	2
2	Sketch reversed Carnot refrigeration cycle on P-V and T-S graph.	2
3	What is function of expansion device in refrigeration system mention types of expansion devices?	2
4	What is the use of flash chamber in vapour compression system?	2
5	What are the advantages and limitation of Electrolux refrigeration system?	2
6	What is the function of analyzer in vapour absorption refrigeration?	2
7	What is adiabatic dehumidification process?	2
8	What is ASHRAE comfort chart?	2
9	Define GSHF (Gross sensible heat factor).	2
10	What are applications of refrigeration system?	2

PART – B (50 Marks)

11 (a) Explain the working of boot strap refrigeration system with the help of layout diagram and graphs. 5

(b) A 5 ton refrigerating machine operating on Bell Coleman cycle has pressure limits of 10 bar and 1 bar. The temperature of air before compression is 10^oC. The compressed air is cooled to 40^oC before it enters an expander. Assuming both compression and expansion to be adiabatic with   = 1.4. Determine
  i) COP
  ii) Mass of air circulated per min
  iii) Power rating of motor assuming 90% mechanical efficiency Assume C_p = 1.0 kJ/kg-K 5

12 A refrigerating machine using R-12 as working fluid works between the temperatures -18^oC and 37^oC. The enthalpy of the liquid at 37^oC is 78 kJ/kg. The enthalpies of R-12 entering and leaving the compressor are 200kJ/kg and 238 kJ/kg respectively. The rates of circulation of refrigerant is 2kg/min and efficiency of compressor is 0.85. Determine
i) Capacity of the plant in Tons of refrigeration
ii) Power required to run the plant
iii) COP of the plant. 10

13 (a) Explain the principle and working of steam jet refrigeration system and also mention its advantages and application. 5

(b) Compare Vapour compression and Vapour absorption refrigeration systems. 5

14 (a) What are the requirements of comfort air conditioning? 5

(b) Explain the following by representation on psychometric chart 5
  i) Cooling and dehumidification
  ii) Heating and humidification

15 (a) What is energy conservation in air conditioned building? 5

(b) What is ducting? What are different types of duct layout? 5

.....2

16 (a) Explain the following air conditioning equipments   5
        i) Humidifier and dehumidifier
        ii) Filters
        iii) Grills.
   (b) $100m^3$ of air per minute at 15^oC DBT and 80% RH is heated until its temperature
        Becomes 22^oC Find
        (i) Heat added to air per minute
        (ii) RH of heated air and its WBT.
        Take atmospheric pressure = 1.013 bar   5

17. (a) What are advantages, limitations and application of thermo electric refrigeration.   5
    (b) Explain compound compression system with flash inter cooling.   5

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FACULTY OF ENGINEERING

B. E. (A.E) (CBCS) VI – Semester (Supply.) Examination, December 2019

Subject: Performance & Testing of Automotive Vehicles

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. Explain the factors affecting the (cd) drag co-efficient.
2. What are the factors that effect rolling resistance?
3. List out types of automotive gear box.
4. Draw and list out the parts of coil spring type clutch.
5. Explain RAC rating, SAE rating and DIN rating.
6. Write some effects on fuel economy by tyre and road condition.
7. List out the types of steering system in Automobile.
8. Define Roll centre.
9. Explain how the clutch is to be tested.
10. What are the main parameters of the vehicle which are need to be observed during road and track testing?

PART – B (5 x 10 = 50 Marks)

11. Explain briefly the effects of front and rear and geometry on drag co-efficient with neat sketches.   10

12. Derive an expression for friction torque acting on cone clutch.   10

13. Explain with a neat sketch of the following:

     (a) Sliding Mesh gear box.   5

     (b) Constant Mesh gear box.   5

14. (a) What are the factors that effect the performance of an engine?   5

     (b) What are the factors that effect thermal efficiencies of the IC engines?   5

15. Explain briefly the Mechanics of a Hydraulic braking system.   10

16. What is the significance of Performance tests? Mention different tests of performance and explain them in brief.   10

17. Write a short note on

     (a) Characteristics and features of friction clutch.   4

     (b) Torsion Bar and Stabilizer bar.   4

     (c) Operational performance characteristics.   2

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FACULTY OF ENGINEERING

B.E. VI-Semester (CBCS) (CSE) (Suppl.) Examination, December 2019

Subject : Software Engineering

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

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

PART- A (20 Marks)

1.	Define personal and team software process?	2
2.	What are specialized process models?	2
3.	What is Planning? List out principles of planning?	2
4.	List the tasks involved in Requirements engineering?	2
5.	Differentiate between cardinality and modality?	2
6.	What is pattern based software design?	2
7.	List out Golden rules for user Interface Design?	2
8.	What is the use of OCL (Object constraint Language)?	2
9.	Write any 3 differences between verification and Validation?	2
10.	What is metric? Enlist source code metrics?	2

PART- B (50 Marks)

11. a)	Explain unified process model?	5
b)	Explain Agile Process model in detail?	5
12.	Write are requirements engineering tasks? Explain validating & negotiating requirements?	10
13. a)	Explain in detail class based modeling?	5
b)	Explain the design model with an example?	5
14.	How to map data flow into software architecture explain with a suitable example?	10
15. a)	Explain while Box testing in detail?	7
b)	What is SQA Plan?	3
16 a)	Explain Basis path testing?	5
b)	Discuss about a framework for product metrics?	5
17.	Explain	
a)	Boundary value Analysis	5
b)	Metrics for Testing	5

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FACULTY OF ENGINEERING
B.E. VI – Semester (CBCS) (IT) (Suppl.) Examination, December 2019

Subject: Web Application Development

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

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

Part – A (20 Marks)

1　Differentiate between check box and radio button elements in HTML.　(2)
2　Describe the Box Model of Cascading Style Sheets.　(2)
3　State the reasons for preferring XML-Schemas over XML-DTDs.　(2)
4　List the types of elements in XML Schema.　(2)
5　State the advantages of JSON over XML.　(2)
6　Describe any two events in JavaScript that are generated at document level.　(2)
7　Define the usage of $scope variable in AngularJS.　(2)
8　Describe the working of AngularJS services.　(2)
9　State the relationship between document and collection in MongoDB.　(2)
10　List the uses of Express framework.　(2)

Part – B (50 Marks)

11 a) Explain the purpose of <span> and <div> tags with examples.　(5)
　　b) List and explain the different types of CSS selectors.　(5)

12 a) Explain the following features of DTD and give examples for each: ELEMENT, ATTLIST and ENTITY　(5)
　　b) Create an XML document instance for information about patients in a hospital. Information about patients must include their name (in three parts: First, Middle and Last), Aadhar number, age, and room number.　(5)

13 a) Explain the syntax of following JQuery selectors and give examples for each: element selector, id selector and class selector.　(5)
　　b) Write a JSON instance document to represent Employee information like empno, ename, sal, designation, manager, deptno, etc. The document instance must include at least 3 objects.　(5)

14 a) Explain the following directives in AngularJS: ng-app,ng-bind and ng-model　(5)
　　b) Write a HTML page to define a module in AngularJS, and use that module in the body tag.　(5)

15 a) Describe the components of the SMACK stack.　(5)
　　b) Write the syntax of the following file system methods of Node.js: open(), readFile(), write(), appendFile(), unlink()　(5)

16 a) Explain the fields of request and response phases of Hypertext Transfer Protocol (HTTP).　(5)
　　b) Develop an Internal DTD for student data. It should contain the following details: name, roll no and SGPA.　(5)

17 Write short notes on the following:
　　a) Event handling in JavaScript　(5)
　　b) Input validation using Angular JS　(5)

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FACULTY OF ENGINEERING

B. E. (Civil) (AICTE) III – Semester (Main) Examination, December 2019

Subject: Engineering Geology

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 specific gravity of a mineral give one example?

2. Explain about texture.

3. Explain hydrological cycle.

4. Define the terms Aquifer and soil.

5. Write the causes of earthquakes.

6. What is stand-up time? Classify the rock according to stand-up time.

7. Draw a neat sketch of Dam label it.

8. What is spring?

9. List any three groundwater zones of India.

10. What is fault? Write its types.

PART – B (5 x 10 = 50 Marks)

11. Describe the identification characteristics and constructional use of,
    (a) Granite   (b) Sandstone   (c) Gneiss   (d) Quartzite   (10)

12. What is Fold? Explain classification and add a note importance in civil engineering. (10)

13. (a) Explain classification of Aquifers.   (5)

    (b) Explain about types of soils and importance.   (5)

14. (a) Discuss in detail about the Fluviatile, Aeolian, Glacial and Marine land forms.   (5)

    (b) Explain with the neat of electrical resistivity method.   (5)

15. (a) What are building and decorative stones give any two Indian examples.   (5)

    (b) Describe geological considerations for a masonry dam.   (5)

16. Discuss the various problems in tunneling, suggest the necessary solutions accordingly   (10)

17. Identify the elements at risk, causes, typical effects and main mitigation measures of landslides.   (10)

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FACULTY OF ENGINEERING

B. E. (AICTE) (EEE/Inst.) III – Semester (Main) Examination, December 2019

Subject: Analog Electronics

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. Name the two types of reverse breakdowns which occur in a P-N junction diode.   2
2. What is meant by filter? Draw any two filter circuits used in rectifiers.   2
3. What are three regions of operation of a transistor?   2
4. What do you understand by terms channel and drain in JFET?   2
5. What is feedback in amplifiers?   2
6. An amplifier has a voltage gain of 40. The amplifier is now modified to provide a 10% negative feedback in series with the input. Calculate voltage gain with feedback and loop gain.   2
7. What is the Barkhausen criterion for the feedback oscillator?   2
8. Why a power amplifier is always preceded by a voltage amplifier?   2
9. What are the characteristics of ideal operational amplifier?   2
10. Draw the circuit of a Zen-crossing detector? Mention the applications of the same.   2

PART – B (5 x 10 = 50 Marks)

11. (a) Draw and explain V-I characteristics of P-N junction diode.   5

    (b) What do you mean by a clipper? Discuss in detail diode as a clipper.   5

12. (a) Define stability factor and obtain an expression for a fixed bias circuit.   5

    (b) Explain the construction, operation and volt-ampere characteristics of a JFET.   5

13. (a) Explain the effect of negative feedback on various characteristics of the amplifier.   5

    (b) Prove in a negative feedback amplifier $\left|\dfrac{dA_f}{A_f}\right| = \dfrac{1}{1+A\varsigma}\left|\dfrac{dA}{A}\right|$ where A_f = gain with feedback, A = transfer gain and β_e feedback ratio.   5

14. (a) Explain the working of Wien bridge oscillator and derive the expression for the frequency of oscillation.   5

    (b) What are power amplifiers? Classify them according their operation and explain any one of it.   5

15. (a) Explain how the op-amp can be used as a summing amplifier with a neat circuit diagram.   5

    (b) Describe the working of op-amp differentrator circuit. Derive the expression for output voltage.   5

16. (a) How Zener diode acts as Voltage regulator? Explain with suitable circuit.   5

    (b) Draw the transistor CE configuration setup to obtain input and output characteristics.   5

17. (a) Explain the four types of feedback topologies with the help of schematic diagram.   5

    (b) Explain the DC and AC characteristics of an operational amplifier.   5

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FACULTY OF ENGINEERING

B.E. (M/P) (AICTE) III – Semester (Main) Examination, December 2019

Subject: Thermodynamics

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 Differentiate between Intensive and Extensive properties
2 Define thermodynamics system. What are types of systems?
3 Explain Joules experiment of first law of thermodynamics
4 What are limitations of first law of thermodynamics?
5 Define availability and irreversibility
6 Define Carnot theorem
7 Define:
    i)   Triple point
    ii) Critical point
8 What are Maxwell relations?
9 What are assumptions made in air standard cycles?
10 Sketch P-H diagram of vapour compression cycle and mention the thermodynamic process in it.

PART – B (5x10 = 50 Marks)

11 a) Explain the procedure to measure ideal gas temperature.   6
    b) Explain Dalton's law of partial pressure.   4

12 a) Derive steady flow energy equation.   5
    b) 90 kJ of heat are supplied to a system at a constant volume. The system rejects 95 kJ of heat at constant pressure and 18 kJ of work is done on it. The system is brought to original state by adiabatic process.
      Determine:
      i)   The adiabatic work
      ii) The values of internal energy at all end states if initial value is 105 kJ.   5

13 a) Explain working principle of Carnot cycle and also derive its efficiency.   5
    b) Calculate the change of entropy of 1 kg of air expanding polytropically in a cylinder behind a piston from 7 bar and $600^{o}C$ to 1.05 bar. The index of expansion is 1.25.   5

14 a) Explain Pressure – Temperature P – T diagram of water.   6
    b) Find the specific volume and enthalpy of wet steam at 18 bar, dryness fraction 0.85.   4

15 a) Explain Diesel cycle with P – V and T – S graph also derive its efficiency.   6
    b) An engine of 250 mm bore and 375 mm stroke is working on Otto cycle. The clearance volume is $0.00263m^{3}$. Find air standard efficiency of the cycle.   4

16 a) Explain working principle of reversed Carnot cycle.   5
    b) Derive Clausius Inequality. State its significance.   5

17 a) Derive the expression of work done in polytropic process.   5
    b) What is quasi state process?   5

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FACULTY OF ENGINEERING
B.E.(A.E) III – Semester (AICTE) (Main) Examination, December 2019

Subject: Thermal Engineering

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. What is Quasi-Static Process?
2. State the Zeroth law of Thermodynamics .What is its importance?
3. Define C.O.P of Refrigerator.
4. What is a perpetual motion machine of 2nd kind (PMM-II)?
5. Differentiate between closed cycle gas turbine and open cycle gas turbine.
6. What are the essential components of a closed gas turbine?
7. Draw the schematic diagram of a Rankine cycle.
8. What is single acting Air Compressor and Double acting air compressor?
9. What is a reversed Carnot Cycle?
10. What is a hybrid System? Mention any two Hybrid systems.

PART – B (5x10 = 50 Marks)

11 a) State and Explain the First law of Thermodynamics.   (5M)
   b) One Kg of air is heated in a closed vessel at a constant volume from a pressure
      of 2 bar to 5 bar. If the initial temperature of the air is 300K, determine the change
      in internal energy of the air. Assume C_v=0.712KJ/Kg K for air.   (5M)

12. a) Derive equations for work done in an isothermal process and a polytropic
       process.   (5M)
    b) State and explain Kelvin Plank statement and Clausius statement.   (5M)

13 a) Explain the standard Brayton cycle with the help of neat sketch and also draw its
      P-V and T-S diagrams.   (5M)
   b) A simple closed gas turbine cycle works between temperature limits of 300 K
      and 1000 K and pressure limits of 1 bar and 5 bar. Calculate the power developed
      by the turbine per kg of air supplied. Take Cp = 1.008 kJ/kg K and $_{air}$ = 1.4.   (5M)

14 a) Draw P-V and T-S diagrams for single stage reciprocating air compressor without
      clearance. Derive equations for amount of work done when compression is:
      i) Isothermal and (ii) Isentropic.   (5M)
   b) Explain the formation of steam with the help of suitable diagram.   (5M)

15 Write short notes on (a) Hybrid vehicles (b) Solar powered vehicles.   (10M)

16 a) Explain Vapour Compression refrigeration cycle.   (5M)
   b) State the properties of a good refrigerant. Name some of the refrigerants used in
      the refrigeration cycles.   (5M)

17 a) Describe briefly the Rankine cycle and show in what respect Rankine cycle
      differs from Carnot cycle between the same temperatures.   (6M)
   b) A Carnot engine working between 650 K and 310 K produces 150 kJ of work.
      Find (i) its thermal efficiency and (ii) the Heat added during the process.   (4M)

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FACULTY OF ENGINEERING

B. E. (CSE) (AICTE) III – Semester (Main) Examination, December 2019

Subject: Programming Languages

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

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

PART – A (20 Marks)

1. Write briefly about the different programming domains.

2. Define Pause Tree and give an example.

3. Explain sub-range data type and what are its advantages?

4. Discuss the necessity of named constant. Give examples in C and ML.

5. What are the advantages of generic sub-programs?

6. What is scope and lifetime of a variable? Mention the scope and life time of a static variable in C.

7. Define Monitor.

8. Explain the use of "finally" in Java.

9. What is lazy evaluation?

10. Write a Python procedure to find GCD of two numbers.

PART – B (50 Marks)

11. Explain the different programming paradigms, with appropriate code examples. (10)

12. (a) Discuss the design issues of arithmetic expressions. (6)

    (b) Define name and structure type compatibility. Give examples. (4)

13. (a) In what ways are co-routines difficult from conventional subprograms. (4)

    (b) List the design issues of functions and discuss their implementation in programming languages. (6)

14. (a) Define Task with a neat diagram and explain the different task states. (5)

    (b) Explain the features of Inheritance and dynamic binding in small talk. (5)

15. (a) List out the differences between function programming languages and imperative programming languages. (5)

    (b) Write about the Pragmatics of scripting languages. (5)

16. (a) Mention Type-casting and Type-coercion, with examples. (4)

    (b) Write BNF statement for "assign" and using left most derivation, derive the expression. A = B x (A + C). Draw the pause tree for the expression. (6)

17. (a) Discuss pass-by-reference and pass by name with examples. (4)

    (b) Explain Fact statements, rule statements and goal statement in prolog with examples. (6)

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FACULTY OF ENGINEERING

B.E. ¾ (Civil) II – Semester (Backlog) Examination, December 2019
Subject: Theory of Structures – II

Time: 3 hours
Max. Marks: 75

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

PART – A (25 Marks)

1. Develop stiffness matrix for 2D truss element. [3]

2. Draw Influence lines for bending moment at mid-span for a simply supported beam. [2]

3. State three properties of Stiffness matrix. [2]

4. What are statically determinate and indeterminate structures? [2]

5. Show that flexibility and stiffness matrices are inverses to each other. [3]

6. A cable carrying a load of 8 KN/m is stretched between supporters which are at same level and 80m apart, the central dip is 8m. Find the maximum and minimum tension in the cable. [3]

7. Show the diagram and write the equations for shape and length when the cable is carrying uniformly distributed load. [3]

8. What do you understand by stiffening a girder? [2]

9. Briefly explain about enveloping parabola and EUDLL. [3]

10. Define kinematic inderminacy. [2]

PART – B (50 Marks)

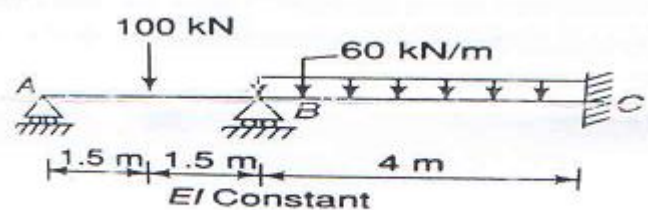11. Analysis the continuous beam shown in Fig A. using Displacement Method. Draw SFD and BMD. [10]

Fig A

12. A simply supported beam of clear span 20 m is subjected to a series of concentrated loads as shown in Fig. B Determine reactions. Find the SF at a section 7.5 from the left end, and BM at 9m from the left end. [10]
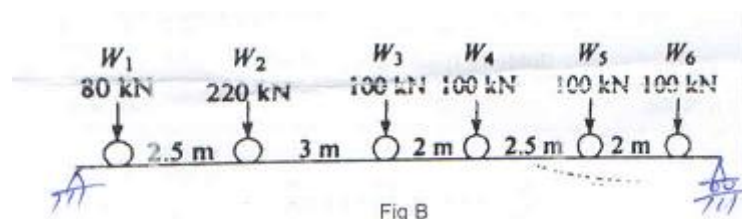

Fig B

13. Briefly explain:

    a) Advantages of matrix methods of analysis

    b) Direct element method.

    c) Differences between flexibility and stiffness methods. [10]

14. Draw the influence lines for the forces in the members M_3L_4, M_3L_3 for the truss shown in Fig C. Find the maximum force in M_3L_4 when there is a moving load of 65 KN/m on the truss longer than the span. [10]
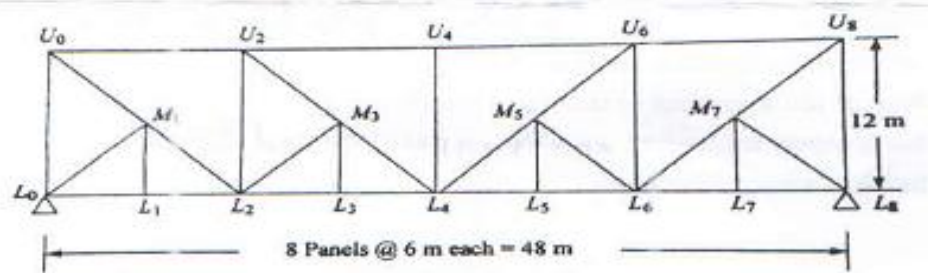

Fig C

15. A suspension bridge of 100 meters span has two three hinged stiffening grinders supported by two cables having a central dip of 10 meters. The roadway has a width of 6m. The right half of the bridge is loaded with the dead load of $5KN/m^2$ and live load of $10KN/m^2$. Determine the reactions. Find the SF and BM at 20m from left end. Draw the SFD and BMD. [10]

16. Analyse the continuous beam shown in Fig D. if the downward settlement of supports B and C in KNm are 2000/EI and 1000/EI respectively. [10]

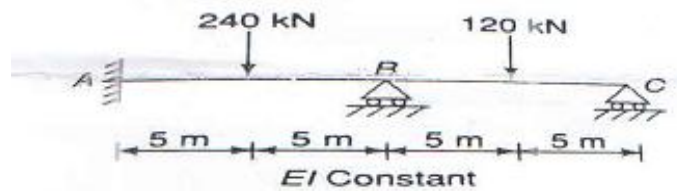Fig D

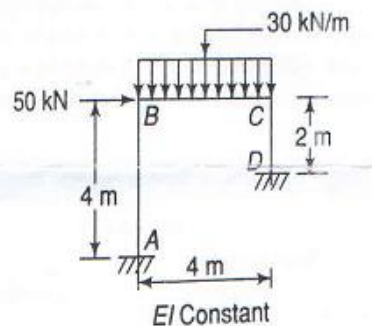17. Analyse the portal frame ABCD shown in Fig. E, using Force Method. Draw SFD and BMD. [10]

Fig E

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FACULTY OF ENGINEERING

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

Subject : Switch Gear and Protection

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 the difference between isolators and electrical CB?	1
2	What do you mean by over-reach and under-reach of distance relay?	2
3	What is the principle of operation of distance relay, explain with a diagram? List the various types of Distance Relays.	4
4	List the various types of amplitude comparators and phase comparators.	3
5	What do you understand by field suppression of an alternator? How it is achieved?	2
6	Magnetising inrush current is observed in which equipment and why? How are the harmonics in inrush current different from that of fault current?	2
7	What is meant by auto reclosure? Why it is needed in a Power System?	2
8	Give the classification of the various types of Circuit Breakers.	4
9	What is over-voltage? List the various types of over-voltages.	3
10	Define Basic Impulse Insulation Level (BIL). What is its standard value?	2

PART – B (50 Marks)

11 a) What is an auxiliary relay? List the various auxiliary relays and state their functions.   **4**

     b) An I.D.M.T. over current relay has a current setting of 150% and a time multiplier setting of 0.6. The primary of the relay is connected to the secondary of the transformer having a ratio of 400/5. Calculate the time of operation if the circuit carries a fault current of 5000A. The time-current characteristics of the relay is shown in the figure below.   **6**
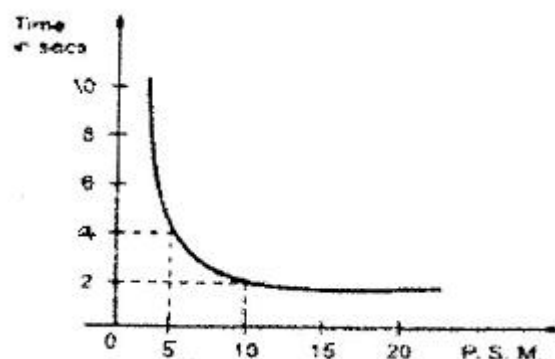
12 a) List the merits and de-merits of static relays.   **3**

     b) Derive the operating conditions of a distance relay from the fundamental principle.   **3**

     c) What is the need of a directional unit in distance protection? State the torque equation of directional unit and explain the condition to be satisfied for it to operate.   **4**

..2

13 a) Explain the percentage differential protection of a Y – Δ transformer with a diagram. 5

    b) An 11KV, 100MVA alternator is grounded through a resistance of 5 Ω. The CTs have a ratio of 1000/5. The relay is set to operate when there is an out of balance current of 1A. What percentage of the generator winding will be protected by the percentage differential protection scheme? 5

14 a) What is resistance switching? Derive the expression for critical resistance in terms of system parameters which gives no transient oscillations. 5

    b) Explain the construction and operation of Minimum Oil Circuit breaker with a neat diagram. 5

15 a) Explain the wave shape of voltage due to lightining with the equation and graph. 3

    b) What is Ferranti surge absorber? Draw the diagram. 2

    c) A 50Hz overhead line has a line to ground capacitance of $1.2\mu F$. It is decided to use a ground fault neutralizer. Determine the reactance to neutralize the capacitance of i) 100% of the length of the line ii) 80% of the length of the line. 5

16 a) Compare the time-current characteristics of inverse, very inverse and extremely inverse current relays with a diagram. Give their equations showing the relationship between time-current. 5

    b) Derive the expression for RRRV and Restriking voltage. 5

17 a) Explain the construction and operations of an induction disc type directional relay. Derive its torque equation. 5

    b) Define and explain the various components of the fault clearing time of a circuit breaker with a diagram. 5

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FACULTY OF ENGINEERING

B.E ¾ (Inst.) II-Semester (Backlog) Examination, December   2019

Subject: Power Plant Instrumentation

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

Note: Answer all the questions from Part A and answer any five questions from part B.

Part - A (25 Marks)

1.	What is meant by Attemperation?	3
2.	Explain the importance of I&C in TPP?	3
3.	Explain the basic principle involved in Nuclear power plant?	3
4.	What are non – conventional energy sources?	3
5.	Draw the block diagram of power generation using TPP?	3
6.	What is central bin system in coal handling?	2
7.	What is meant by feed water conditioning?	2
8.	How many types of condensate systems are present in TPP?	2
9.	What are the types of non-contact type transducers for speed measurement?	2
10.	Draw the correct position of economizer in feed water control.	2

Part - B (50 Marks)

11. a)	With a neat diagram explain the boiler following mode?	7
b)	Write briefly about draught in TPP?	3
12	With a neat diagram explain lubricating oil temperature control in turbine supervision and control system?	10
13.	With a neat diagrams explain the steam generator control?	10
14.	With a neat diagram explain the ball and race Pulverisor?	10
15 a)	With a neat block diagram explain TSI (Turbine supervisory instrumentation)	6
b)	Discuss about Flame monitoring?	4
16	With relevant diagrams explain piping system for pressure measuring devices in TPP?	10
17.	Write short notes on:	
a)	P & I diagram of boiler	6
b)	Boiler drum level control system	4

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FACULTY OF ENGINEERING
BE3/4 (ECE) II Semester (Backlog) Examination, December 2019

Subject: Antennas and Wave Propagation

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 Explain about antenna polarization.   3
2 What are the E-plane and H-plane patterns?   2
3 List the important application of Helical antenna.   2
4 Compare the loop antenna with short dipole   3
5 Calculate the gain of a parabolic reflector antenna which has a diameter of
   10 m operating at 10 GHz with an illumination efficiency of 55%.   3
6   List out the advantages and disadvantages of Lens antennas.   2
7   Find the relative excitation levels of a binomial array of 2 & 3 elements.   2
8   Explain about Beam Scanning.   3
9 Calculate the line of sight distance between two elevated antennas in a
   communication link having ht = 49 m and hr = 9 m.   3
10 Where is the tropospheric region that contributes most strongly to tropospheric
   scatter propagation?   2

PART- B (50 Marks)

11. a) What is a Hertzian dipole? Obtain expressions for the radiation fields of
        Hertzian dipole.   7
    b) Calculate the maximum effective aperture of an antenna which is operating at
        wavelength of 2 meters and has a directivity of 100.   3

12. Describe the characteristics of 3-turn helical antenna with reference to circular
    polarization with a suitable example.   10

13 a) In the measurement of the antenna gain using three antenna method, 3 horn
       antennas A, B & C are measured in pairs at 12 GHz. The separation of
       antennas is 8m. The transmitted power is + 3dBm. The received powers
       are -31dBm, - 36dBm and -28dBm, for antenna pairs AB, AC & BC
       respectively. Find the gain of the antenna.   5
   b) A parabolic reflector antenna is circular in cross section with a diameter
       of 1.22 m. If the maximum effective aperture equals 55 percent of the
       physical aperture. Compute the gain of the antenna in decibels at
       20 GHz (= 15mm).   5

14 Using the principle of pattern multiplication describe the radiation characteristics
   of binomial array antenna.   10

15. a) Describe the ionosphere reflection of radio waves. Derive an expression for
        critical frequency of a reflecting layer in terms of its ionization density.   6
    b) What are different ways a radio wave propagates in free space?   4

16. a) Describe the radiation mechanism of a patch antenna.   5
    b) Discuss the effect of earth on vertical radiation patterns of an antenna.   5

17. Write short notes on:
    a) Feed Mechanism of Log-Periodic antenna.   5
    b) Duct Propagation   5

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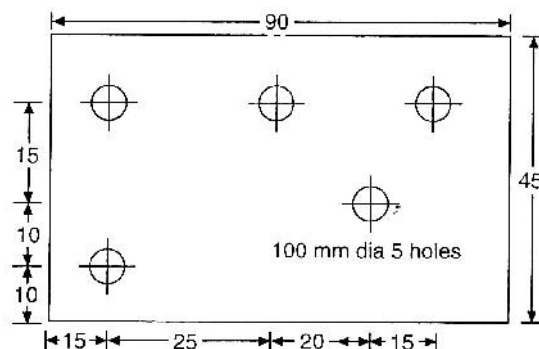# FACULTY OF ENGINEERING
B.E. 3/4 (M / A.E) II – Semester (Backlog) Examination, December 2019

Subject: CAD / CAM

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 Define CAD and CAM?	2
2 What are the Various Graphic I/O devices?	2
3 What do you mean by Homogeneous Co-ordinates?	3
4 Differentiate Non-parametric and parametric representation of curves.	3
5 Write any four properties of Bezier curves.	2
6 What do you mean by concatenation?	3
7 State the features of machining centre?	2
8 How do you specify a Robot?	2
9 Define CAPP.	3
10 State the features of reverse Engineering?	3

PART – B (5x10 = 50 Marks)

11 a) Show the equation of Bezier curve for four control points.   5
   b) Four vertices of Bezier polygon are Po(1,1), P1(2,3), P2(4,3) and P3(3,1). Determine seven points on the Bezier curve.   5

12 a) Explain B-REP and C-Rep approach of solid modeling with examples.   5
   b) A triangle A(1,1), B(2,1) and C(1,3) is rotated by an angle of 45°. Find the co-ordinates of the triangle.   5

13 a) Write short Notes on i) Mechanical Tolerance, ii) Mass property calculation.   5
   b) What is FEA? What are the basic steps involved in it.   5

14 Write an APT part program for the profile shown in fig.1 with cutting speed and feed rate as 500 rpm and 100 mm/min. The cutter is of 10 mm diameter and depth of the job is 15 mm. Use macro statements for drilling operation.   10

15 a) What is a DNC system? Discuss types of DNC with sketch.   5
   b) List various drives used in Robot. Describe programming methods in Robot.   5

16 a) What is the difference between retrieval and generative types of CAPP.   5
   b) What is rapid prototyping? Explain any one method with sketch.   5

17 a) What is GT? Describe optic and MICLASS coding system.   5
   b) What is FMS? Explain the role of AGV in FMS?   5

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FACULTY OF ENGINEERING
B.E. 3/4 (Prod.) II - Semester (Backlog) Examination, December 2019

Subject : Turbo Machinery

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

Note: Answer all questions from Part-A & any five questions from Part-B.
PART – A (25 Marks)
1.   Classify the various types of turbo machines.
2.   Define specific speed of a pump and write its expression.
3.   Define critical pressure ratio
4.   What is the significance of priming in centrifugal pump.
5.   Define unit quantities?
6.   Draw the velocity triangles for an axial flow reaction stage
7.   Draw velocity diagram of Francis turbine
8.   Define degree of reaction
9.   Explain the differences between impulse and reaction steam turbines
10.   List the merits of open cycle gas turbine over closed cycle gas turbine.

PART-B (50 Marks)
11. (a) A jet of water with a velocity of 60m/sec strikes a curved vane moving
     at 30m/sec, the jet makes an angle of deflection is 120^0. Determine the
     work done of water and Hydraulic efficiency.   (5)
    (b) Derive Euler's equation for turbo machines.   (5)

12. A centrifugal pump having outer diameter equal to two times the inner
    diameter and running at 1200rpm works against a total head of 75 m.
    The velocity of flow through the impeller is constant and equal to 3 m/s.
    The vanes are set back at an angle of 30° at outlet. If the outer diameter of
    impeller is 600 mm and width at outlet is 50 mm, determine : a) vane angle
    at inlet b) work done per second by impeller c) manometric efficiency.   (10)

13. (a) Explain with a neat sketch, the working of a single stage centrifugal
        pump.   (5)
    (b) Differentiate between axial and centrifugal compressors.   (5)

14. Discuss the working principal of Pelton wheel with a neat sketch.   (10)

15. In a single stage impulse turbine, the nozzle angle is 30˚ to the tangential
    direction and the blade speed is 210m/sec. the steam speed is 550m/sec.
    blade friction coefficient is 0.85. Assuming axial exit and flow rate of 700 kg/hr,
    determine the blade angles and power developed by the turbine. Also
    find the absolute velocity of steam at exit.   (10)

16. In a gas turbine plant, operating on Joule cycle, air is compressed from
    1 bar and 15°C through a pressure ratio of 4.5. it is then heated to 700°C
    in a combustion chamber and expanded to a pressure of 1 bar. Calculate
    the net work done, cycle efficiency and work ratio.   (10)

17. (a) Draw performance and characteristic curves of turbines.   (5)
    (b) Methods of improving thermal efficiency of gas turbines.   (5)

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FACULTY OF ENGINEERING

B.E. 3/4 (CSE) II – Semester (Backlog) Examination, December 2019

Subject: Compiler Construction

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	What is a compiler?	2
2	Differentiate pass and phase	2
3	List down the conflicts during shift-reduce parsing	2
4	What is hashing? Explain.	3
5	Write LR(0) items for $A \rightarrow (A) \mid a$	3
6	Differentiate compiler and interpreter.	2
7	What is a flow graph? Explain with an example	3
8	Convert the expression a= b*-c + b*-c into Three Address statements?	3
9	Define data flow analysis.	2
10	Differentiate Abstract Syntax Tree and DAG representations of intermediate code	3

PART – B (5x10 = 50 Marks)

11 a) Explain the various phases of a compiler in detail. Also write down the output for the following expression after each phase a: =b*c+60.   7

    b) What is LEX?   3

12 a) Define an LL (1) grammar. Is the following grammar LL (1).
       S   iEtS | iEtSes |a
       E   b
       Also write the rules for computing FIRST() and FOLLOW().   6

    b) What are the goals of error handler in a parser?   4

13 a) Construct an SLR parsing table for the grammar, Is it SLR (1) grammar?
       S   CC
       C   aC|d   6

    b) Write a note on YACC.   4

14 Explain the use of symbol table in compilation process. List out the various attributes for implementing the symbol table.   10

15 a) Explain the following with example:
    i) Quadruples
    ii) Triples iii) Indirect triple   5

   b) Convert the following program into 3 address code
    for(i=10,1<20,i++)
        {
        P=Q*R+S;
        A=B+D*C
        }   5

16 a) What is the role of code Optimizer in compiler? Is it a mandatory phase?   5

   b) Construct a DAG for the expression: a+a*(b-c)+(b-c)*d.   5

17 Write Short Notes on: **ANY TWO**   10

   a) Symbol table organizations

   b) Basic blocks and their construction

   c) Peephole Optimization.

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FACULTY OF ENGINEERING

BE 3/4 (IT) II Semester (Backlog) Examinations, December 2019
Subject: Compiler Construction

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 analysis and synthesis parts of compiler.	3M
2.	Define compiler pragmatics.	2M
3.	Define CFG.	2M
4.	Define syntax tree.	2M
5.	Define handle.	2M
6.	Define handle pruning.	2M
7.	Write about procedure activation record.	3M
8.	Explain activation trees.	3M
9.	Discuss about three address codes.	3M
10.	Compare TAC and P-code.	3M

PART – B (5 x 10 = 50 Marks)

11. a) Briefly describe the TINY language.   5M

     b) Explain bootstrapping with a neat diagram.   5M

12. Construct LL(1) parsing table for   10M

     exp   term exp'

     exp'   addop term exp'|ε

     addop   + | -

     term   factor term'

     term'   mulop factor term'| ε

     mulop   *

     factor   (exp)|number

13. Construct a SLR parser for A   (A) | a   10M

14. a) Explain calling sequence.   5M

     b) Explain with example pass by value parameter passing mechanism.   5M

15. a) Write P-code for the following code 2* a+(b-3)   5M

     b) Discuss about instruction ind and ixa with an example.   5M

16. Explain the translation process with a neat diagram.   10M

17. a) Example porting process with a neat diagram.   5M

     b) Explain construction of parse tree with an example.   5M

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