Code No: 192

FACULTY OF ENGINEERING

B.E. III/IV (Civil) II – Semester (main & Backlog) Examination, May/June 2018

Subject: Structural Engineering Design & Detailing – I (RCC)

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

Note: Answer all questions from Part A & any ONE question from each unit.
Assume suitable data if required.

PART – A (25 Marks)

1) Why combined footings are designed? 2
2) What is counter fort retaining wall. 3
3) How do you check meridianal stress and circumferential stress? 3
4) What is shear key, how do you design it. 2
5) How do you calculate the base width of the counter fort retaining wall 3
6) Define the dome. Where do we provide. 3
7) What is effective width method? 3
8) Give the limitations of the impact factor. 2
9) What is dispersion length, how do you calculate the same. 2
10) Differentiate between class AA and class 70R loading. 3

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	= 550mmx550mm
Axial load on each column	= 980 kN
Spacing of the column	= 4.5 mc/c
SBC of the soil	= 290 kN/m^2
Materials used	= M_{30}, Fe_{500} grade steel

OR

12 Design a counter fort retaining wall for the following data; 15

Height of fill retained by wall	= 8 m
Surcharge angle	= 12^0
Density of the souil	= 18kN/m^3
Angle of internal friction	= 32^0
Coefficient of friction between soil and base slab	= 0.40
SBC of the soil	= 250 kN/m^2
Material used M_{25} and Fe_{500}	

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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 = 9,00,000 liters

Depth of the storage = 5 m

Free board = 500 mm

Materials used M30 grade concrete and fe500 grade steel

OR

14 Design an Intz type of water tank to store 1.8 million of water. The height of the tank above ground level is 16 m. Depth of foundation is 3.0 m below ground level, basic wind pressure 2.0 kN/m^2 number of supporting columns = 10. Adopt M25 grade concrete and Fe500 grade steel. Design the top ring beam, bottom ring beam, conical dome and bottom spherical dome. Use IS specifications. IS456 and IS3370 for design. 15

UNIT – III

15 An RCC deck slab bridge is to be constructed over a trapezoidal channel of 6.5 m base width and side slopes 1:1 laid at a bed slope of 0.35 m/km. Design the slab bridge with the following information. 20

Chezy's constant: 85

Bed level of stream :100m

Full supply level: 101m

Bottom level : 103 m

Materials: M30 grade concrete Fe500 grade steel

Loading : IRC class –AA(Tracked vehicle)

Road width: 7.0 m

Foot path: 650 mm on either side

OR

16 a) Explain the Pigeagaud's method and give advantages of this method. 5

b) Design a deck slab bridge for the clear span of 6m width of the foothpath 1.0 m on either side, wearing coat 100mm, use IRC class AA(Tracked vehicle, M_{30} and Fe_{500})? 15

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Code No. 198

FACULTY OF ENGINEERING

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

Subject : Microprocessors & Micro Controllers

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	Indicate the addressing modes of the following instructions in 8086 i) MOV AX, 45H[BP] ii) MOV DX, 37H[DI]	2
2	Explain operation of the following pins in 8086. i) INTA ii) BHE	3
3	What is the difference between Linker and Debugger tool in Assembly Language Programming?	3
4	Explain the operation of ADC and CMP instructions in 8086.	2
5	List the various ASCII adjust instructions in 8086 with an example for each.	3
6	List the hardware and software interrupts of 8086.	2
7	Write the important features of programmable internal timer.	3
8	Write a 8051 program to logically XOR two given 8 bit numbers.	3
9	List the only two registers of 8051 which are of 16 bit capacity.	2
10	Mention various applications of 8051 microcontrollers.	2

PART – B (50 Marks)

11	a) Explain the operation of Minimum and Maximum modes in 8086.	6
	b) Explain the difference between procedure and Macros.	4
12	Explain the following 8086 instructions with examples. i) Program control instructions ii) Rotate and shift instructions	10
13	Draw the block diagram of 8255 and explain its features in detail with its control word format.	10
14	With examples explain in detail about the data movement and jump/call instructions of 8051.	10
15	a) With an LCD interfacing diagram explain the instructions required to connect 8051 microcontroller.	6
	b) Write an 8051 Assembly program to implement reverse and logical OR operation of two 8 bit numbers.	4
16	a) Explain the following assembler directives of 8086 i) ASSUME ii) ORG iii) PAGE iv) MODEL v) DW	5
	b) Write an 8086 program to find average of 16 bit ten numbers in an array.	5
17	a) Write an 8051 ALP to sort any ten 8 bit numbers into ascending order.	5
	b) Draw the Timer/Counter control logic diagram in 8051 microcontroller.	5

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Code No: 207

FACULTY OF ENGINEERING

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

Subject: Microprocessor & Microcontrollers

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

Note: Answer All Questions From Part–A. Answer any FIVE Questions FromPart-B

PART-A (25 Marks)

1. Draw the write cycle timing diagram of 8086 minimum mode operation. [3]
2. How does 8086 differentiate between an opcode and instruction data? [2]
3. What are the functions of 8086 pins: (a) DT/$\overline{R}$ (b) $\overline{DEN}$ [2]
4. Draw the functional block diagram of 8254 programmable interval timer. [2]
5. Write about the memory banks in 8051. [3]
6. Compare and contrast microcontroller and microprocessor with respect to advantages and applications. [3]
7. Give the functions of each bit in TMOD register. [2]
8. Write an ALP of 8051 to store a constant onto RAM locations {30H- 34H} using stack operations. [3]
9. How do you double the baud rate in the 8051? [2]
10. What is external memory interfacing in 8051? [3]

PART-B [50 Marks]

11. a) Discuss the architecture of 8086 microprocessor and explain the operation of BIU and EU. [5]

    b) Explain physical memory organization of 8086. [5]

12. a) Write an ALP for 8086 to find square root of a two digit number (Assumethat the number is a perfect square) using assembler directives. [5]

    b) Describe the interrupt vector table of 8086. [5]

13. a) Interface the following memory ICs with 8086:

    i) Two 8 KB EPROMs ending at FFFFFH.

    ii) Two 8KB SRAMs starting from C0000H. [5]

    b) Explain the operational modes of 8255 PPI. [5]

14. a) Sketch the pin configuration of 8051 and explain. [5]

    b) Write an ALP in 8051 to convert packed BCD to unpacked BCD and vice-versa. [5]

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15. a) Write an ALP for 8051 to generate a square wave of 10 KHz frequency at Port pin P1.1 using Timer 1 of 8051. [5]

b) What do you mean by 'framing' in asynchronous serial data communication**?** Illustrate with an example. [5]

16. Write a program to interface a DAC 0808 to 8051 and generate a sine wave With full scale value of 10V, Vcc = 5V, opamp feedback resistance of 5K. Vary angle from 0º to 360º with 30º increments. [10]

17. Write any **Two** of the following **[5 x 2= 10]**

a) LCD interfacing with 8051.

b) Bit addressable features of 8051.

c) Addressing modes of 8086.

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Code No.216

FACULTY OF ENGINEERING

B.E ¾ (PROD.) II-Semester (Main & Backlog) Examination, May / June 2018

Subject: CAD/FEM

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

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

PART-A (25 Marks)

1. Define CAD and FEM.
2. Compare Wire Frame and Surface modeling.
3. What are the properties of splines?
4. What are the benefits of computer aided design over conventional design process?
5. Explain the term interpolation function.
6. If E=200GPA and ϑ =0.3, Find the D matrix for plane strain problem.
7. Sketch one dimensional quadratic element and write the expressions for shape functions in terms natural coordinates.
8. Explain the application of different elements used in finite element modeling.
9. Determine the shape functions for a four node quadrilateral elements.
10. Write D matrix for axis symmetric elements.

PART-B (50 Marks)

11. a) Explain the engineering design process
    b) Explain design criteria in details.
12. a) Explain the Bresenham's Circle Algorithm
    b) Determine the pixel positions along the circle octant using the midpoint circle algorithm in the first quadrant from x = 0 to x = y for a given radius of 10.
13. Describe with the help of neat sketches the major surface entitles provide by CAD/CAM Systems.
14. Find the nodal displacement and element stresses for a tapered plate shown in fig 1. Where thickness of plate = 10mm, g=78500 N/M^3, E=100GPA

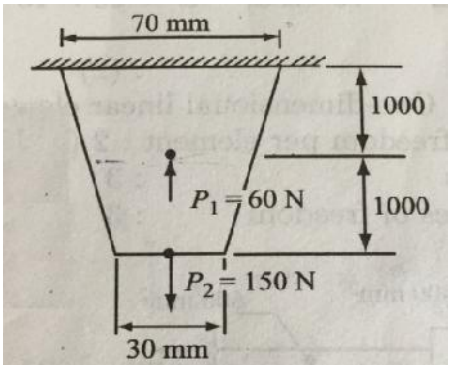

Fig – 1

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15. a) Derive an expression for the stress in truss elements.
    b) Determine nodal displacements and element stresses of the truss shown in Fig 2. The truss members are subjected to a temperature rise of 50°C

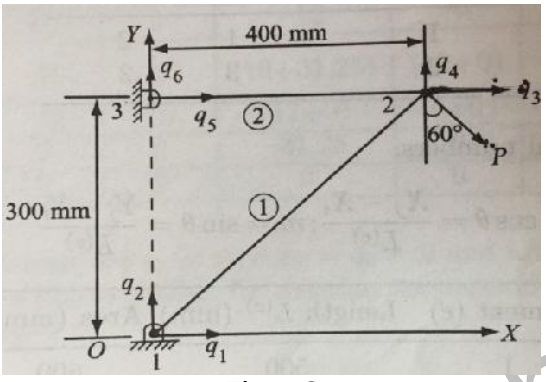

Fig – 2

16. A stepped bar is shown in Fig 3. Find i)Natural frequencies in axial vibration ii) Corresponding eigenvector E= 200 GPA, = 7500 kg/m^3, A = 600 mm^2, L = 300mm

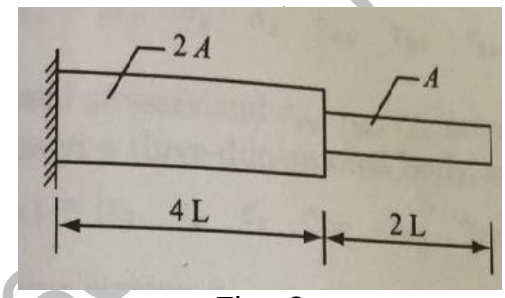

Fig - 3

17. Write short notes on :
    a) Mass property calculation.
    b) NURB.
    c) Mechanical Tolerancing.

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Code No: 223

FACULTY OF ENGINEERING

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

Subject: Object Oriented System 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. What is UML? [2]
2. Define the elements of Basic Behavioural Modeling. [3]
3. Differentiate between Generalization and Realization. [3]
4. Differentiate Sequence and Collaboration diagrams. [3]
5. Define the different states of a State Machine [3]
6. What is an Artifact diagram? [2]
7. What is unified process? [2]
8. What are four P's? [2]
9. What is Requirements Capture? [2]
10. Who are the workers of Implementation phase? [3]

PART-B (5x10=50 Marks)

11. What are the basic building blocks of UML? Explain with their Interrelationships [10]

12. (a) What are use case diagrams? Explain with an example. [5]
    (b)Explain the concept of Swimlanes [5]

13. (a) What are component diagrams? Explain with an example. [5]
    (b) What is the importance of a deployment diagram? Under what circumstances does it become critical? [5]

14. What is Activity diagram? How does it differ from state Chart diagram? [10]

15. What is the need for iterative & incremental model of software development in unified software approach? [10]

16. (a) How are the requirements captured as use cases and used further for Analysis and design phase. [5]
    (b) What are the Core Work Flows? [5]

17. Explain in details the Implementation & test phase and core work flows carried out in them. [10]

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Code No. 228

FACULTY OF INFORMATICS

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

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 is UML? Where can the UML be used? Why is it called as modeling language?	3
2	What is structural modeling of system and how it is different from behavioural modeling?	3
3	What are adornments and extensibility mechanisms in UML? Give examples.	2
4	Define composite, deferred and history states of a state machine.	3
5	What is forward engineering and reverse engineering?	2
6	What is an artifact diagram and explain in what way deployment diagram are useful?	3
7	What are 4P's in software development?	2
8	"The unified process is architecture centric". Justify.	3
9	What are core work flows?	2
10	What is a i) Business model ii) Domain model	2

PART – B (50 Marks)

11	a)	Explain the life cycle of unified process development with neat diagram.	6
	b)	Discuss various relationships in UML with help of examples.	4
12	a)	Define class diagram. What are its contents and common uses?	4
	b)	Draw and explain class diagram for enrolling a student for a course in the university.	6
13	a)	Summarize the modeling techniques used for usecase diagram and state chart diagram.	6
	b)	Explain time and space. How do we specify timing constraints and location in behavioural modeling?	4
14	a)	Give difference between patterns and frame works. Discuss about patterns. Explain how to we model architecture patterns.	5
	b)	What is an artifact diagram and explain in what way deployment diagram are useful?	5
15	a)	Discuss the steps involved in developing architecture of a software system.	5
	b)	What do you mean by iterative and incremental software development? Can they be used to migrate risk? Justify your answer.	5
16	a)	Give a brief description of how an analysis model can be compared with a design model.	5
	b)	Briefly describe the responsibilities of a test engineer in the testing workflow.	5

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17 Differentiate the following : 10

a) Event and Signal
b) Process and thread
c) Collaboration diagram and sequence diagram
d) Systems and models
e) Iteration and Incrementation

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Code No: 160/O

FACULTY OF ENGINEERING

B.E. 3/4 (ECE) II-Sem. (Old) Examination, May / June 2018

Subject: Computer Organization & 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. What is normalization and alignment in floating point arithmetic? [2]
2. Differentiate between restoring and non-restoring division algorithm. [2]
3. Write the instruction formats for memory reference and register reference instructions. [3]
4. What is a pipeline hazard? [2]
5. What are the different addressing modes of a basic computer? [3]
6. What is meant by 'locality of reference 'and how does it help in faster execution of the programs? [3]
7. Differentiate between Synchronous and Asynchronous data transfer. [2]
8. Why does DMA have priority over CPU when both request a memory transfer? [3]
9. Explain virtual address and physical address. [2]
10. Mention the ways that computer buses can be used to communicate with memory and I/O. [3]

PART-B (50 Marks)

11 a) Explain, (with the help of suitable examples) IEEE standard for floating-point numbers. [4]

b) Using booth's multiplication algorithm, multiply two signed numbers -9 and -13 showing all the steps. [6]

12 a) Explain the various phases of an Instruction cycle. [5]

b) Draw the block diagram of control unit of a basic computer and explain, [5]

13 a) What is the purpose of micro program sequencer? Explain with a block diagram, how the sequencer presents address to control memory. [6]

b) Discuss SIMD processor organization. [4]

14 a) Draw the block diagram of an Asynchronous communication interface and explain its operation. [5]

b) Draw a flow chart for a six stage CPU instruction pipeline and explain. [5]

15 Explain the various elements of cache design and various mapping techniques used with cache. [10]

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16 a) How many 128 × 8 memory chips are needed to provide a memory capacity of 4096 × 16? Give the circuit diagram of the memory using the memory chips. [5]

b) Explain how programmed I/O and interrupt initiated I/O operations are carried out. [5]

17. Write any Two of the following [10]
a) Handshaking control of asynchronous data transfer
b) Stored program organization
c) Stack organized Instruction formats

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Code No. 211

FACULTY OF ENGINEERING

B.E. 3/4 (Mech./AE) II– Semester (Main &Backlog) Examination, May/June 2018

Subject: Heat Transfer

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. Briefly explain the physical significance of "critical radius of insulation" as applied to cylindrical shell. (2)
2. Derive expression for temperature distribution, under one dimensional steady heat conduction for the plane wall system. (2)
3. Define thermal diffusivity. Explain its significance in terms of penetration depth for a semi-infinite body. (3)
4. Explain the Heisler charts and its significance in solving transient conduction problems. (2)
5. What do you mean by velocity and thermal boundary layers on a flat plate? (3)
6. Explain the significance of combined forced and natural convection. What is the role of the parameter $Gr./Re^2$ in this regard? (3)
7. What is a radiation shield? Where it is used? (2)
8. Show that the emissive power of a black body is Π-times the intensity of emitted radiation (3)
9. Distinguish between film condensation and dropwise condensation. (2)
10. What is shell-and-tube heat exchanger? Why are baffles used? What are headers? (3)

PART – B (50 Marks)

11. A steel pipe of 20 cm outer diameter with thermal conductivity to 50W/mK of 6mm inner thickness carrying saturated steam. Steel pipe is covered with insulating material of 5 cm thickness. The thermal conductivity of the insulating material is 0.09 W/,K. The inside film heat transfer co-efficient is 1100 W/m^2 and outside film heat transfer co-efficient 12 W/m^2K. It is found that the heat loss is more and it is proposed to add another layer of 6 cm thick insulating material of same quality without changing outer conditions. Determine the percentage of reduction in heat transfer.

12. A copper wire 1m long is used as a heating element in a 13KW heater. The copper surface temperature is 1300 ^0C, ambient air temperature is 22 ^0C, outside surface temperature coefficient is 1.5 kw/m^2k. Thermal conductivity and resistance of the copper are 20 W/mk and 0.021Ω respectively. Calculate (a) Diameter of copper wire, (b) Rate of current flow.

13. A large cast iron at 750 ^0C is taken out from a furnace and its surface is suddenly lowered and maintained at 55 ^0C. Calculating the following.

    a) The time required to reach the temperature 350 ^0C at a depth of 50 mm from the surface
    b) Instantaneous heat flow rate at a depth of 45 mm and on surface after 30 minutes.
    c) Total heat energy after 2 hr for ingot.

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14. A square plate, 40cm x40 cm is at 120 ^{0}C and is exposed to air at 20 ^{0}C. Find the heat loss from the plate if (i) the plate is kept vertical (ii) the plate is placed horizontally. Find the percentage change in flow due to the change in position.

15. The outer header of a high pressure steam super consists of (ε = 0.8) of diameter 27.6 cm. Its surface temperature is 500 ^{0}C. Calculate the loss of heat per unit length by radiation if it is placed in an enclosure at 30 ^{0}C If the header is now enveloped in an .steal screen of diameter 32.5 cm. emissivity of 0.7 and the temperature of the screen is 340^{0}C, find the reduction in heat by radiation due to provision If this screen

16. Dry saturated steam at a pressure of 2.5 bar condenses on the surface of a vertical tube of height 1.5 m. The tube surface temperature is 120 ^{0}C. Estimate the thickness of the condensate film and the local heat transfer co-efficient at a distance of 0.3 m from the upper end of the tube.

17.(a) Explain how the hemispherical emissivity of a real surface varies with wavelength temperature, degree of roughness and degree of oxidation.
(b) Explain the ":Relaxation method" in solving two-dimensional heat conduction problems.

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