FACULTY OF ENGINEERING

B.E. 3/4 (Civil) II – Semester (Suppl.) Examination, December 2016

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

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	What is combined footing ?	2
2	Differentiate between cantilever and counter fort retaining wall	3
3	Give the IS specifications for the design of water tanks ?	3
4	What is staging ? explain.	2
5	Define hoop stress, where it occurs in water tanks ?	3
6	Give the limitations of permissible stresses in water tanks	3
7	What is Inze type water tank ? Explain.	3
8	How impact loads are considered in design of bridges.	2
9	What is effective width method.	2
10	Differentiate between IRC loading and other loadings.	3

PART – B (50 Marks)

Unit-I

11   Design a combined footing for the two columns of multistoried residential
       building using the following data;   (15)

Size of the column	=	500mmx500mm
Axial load on each column	=	900kN
Spacing of the column	=	4mc/c
SBC of the soil	=	280kN/m^2
Materials used.	=	M25, Fe 415 grade steel.

OR

12.   Design in counter for retaining wall for the following data;   (15)

Height of fill retained by wall	=	9m
Surcharge angle	=	10^0
Density of the soil.	=	16 kN/m^3
Angle of internal friction.	=	30^0
Coefficient of friction between soil and base slab.	=	0.50
SBC of the soil	=	260 kN/m^2
Material used M25 and Fe415		

Unit - II

13. Design a circular water tank resting on the ground with a flexible base and spherical dome using the following data;

    Capacity of the water tank   =   8,00,000 liters.
    Depth of the storage   =   5.5 m
    Free board   =   500 mm.
    Materials use M30 grade concrete and fe 415 grade steel   (15)

OR

14. Design an Intz type of water tank to store 1.6 liters of water. The height of tank above ground level is 18 m. Depth of foundation is 1.25 m below ground level, basic wind pressure 1.8 kN/m^2 , number of supporting columns = 12. Adopt M25 grade concrete and Fe415 grade steel. Design the top ring beam, bottom ring beam, conical dome and bottom spherical dome. Use IS specifications. IS 456 and IS 3370 for design.   (15)

Unit-III

15. An RCC deck slab bridge is to be constructed over a trapezoidal channel of 7.0 m base width and side slopes 1:1 laid at a bed slope of 0.25 m/km. Design the slab bridge with the following information.

    Chezy's constant : 80
    Bed level of stream : 100 m
    Full supply level : 102 m
    Bottom level : 104 m
    Materials : M30 grade concrete Fe 500 grade steel.
    Loading : IRC class-AA (Tracked vehicle)
    Road width : 8.0 m
    Foot path : 750 mm on either side.   (20)

OR

16. Design the reinforced concrete slab of an RC T-beam and slab deck using the following data;

    Spacing of the main T-beam   =   3m
    Span of the T-beam   =   20m
    Type of loading   =   IRC class AA tracked vehicle,
        no cross girders have been used.
    Materials.   =   M20 fe500 Grade steel.   (20)

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FACULTY OF ENGINEERING
B.E. 3/4 (EE/Inst.) II - Semester (Suppl.) Examination, December 2016

Subject : Microprocessors and Micro Controllers.

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. List various status flags and control flags of 8086 processor. (2)
2. Discuss the sequence of events that happen when RESET input is issued to 8086. (3)
3. Write about any two program location control directives. (2)
4. Discuss about string related instructions. (3)
5. Give the control word of 8255 for configuring port A as input and other ports as outputs. (3)
6. List various modes of operation of Programmable Interval Timer. (2)
7. Explain any three logical instructions of 8051 controller. (2)
8. Explain the Program Status Word of 8051 controller. (3)
9. List various interrupts of 8051 controller. (2)
10. Give the contents of SBUF and SCON special function registers. (3)

PART-B (5 X 10 = 50 Marks)

11. a) Explain the working of BIU of 8086 processor. (5)
    b) Explain the timing diagrams of any data transfer instruction in 8086. (5)

12. a) Write an assembly language program to add five 8-bit BCD number using 8086. (5)
    b) Explain various interrupts of 8086. (5)

13. a) Explain the interfacing of an A/D converter using 8255 PPI with 8086. (10)

14. a) Explain the architecture of 8255 PPI. (5)
    b) Discuss about various interrupts of 8086. (5)

15. a) Write a program to find number of odd numbers in a set of five 8-bit number using 8051 controller. (5)
    b) Explain the process of serial data transfer in 8051. (5)

16. Explain the procedure of interfacing a seven segment display using 8051. (10)

17. Explain the architecture of 8051 controller with help of a neat sketch. (10)

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FACULTY OF ENGINEERING

B.E. 3/4 (ECE) II-Semester (Supplementary) Examination, Nov. / Dec. 2016

Subject : Computer Organization and Architecture

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 restoring and non restoring division algorithm.   3
2   What is the IEEE standard for binary floating point numbers?   2
3   What is the difference between a direct and an indirect address instruction? How many references to memory are needed for each type of instruction to bring an operand into a processor register?   3
4   Differentiate between a software interrupt and a sub routine call.   2
5   Write the difference between hardwired control and micro programmed control.   3
6   Distinguish between RISC and CISC processors.   2
7   Write the differences between 2 and 3 address instructions.   2
8   List few advantages and disadvantages of memory mapped I/O and I/O mapped I/O. 3
9   What is meant by 'locality of reference' and how does it help in faster execution of the programs?   2
10 Why is page fault? List the page replacement algorithms.   3

PART – B (50 Marks)

11 a) Explain the process of floating point arithmetic addition and subtraction with a flow chart.   7
   b) Describe difficulties in floating point arithmetic.   3

12 a) Explain various phases of an interrupt cycle in detail.   7
   b) Specify the sequence of micro-operations that will perform the following operations in a basic computer.   3
       i) IR←M[AC]   ii) AC←AC+TR   iii) DR←DR+AC

13 a) An instruction is stored at location 500 with its address field at 501. The address field has the value 600. A process register R_1 contains the number 300. Evaluate the effective address if addressing mode of the instruction is   5
       i) Direct   ii) Immediate   iii) Relative   iv) Register indirect
       v) Index with R_1 as the index register.
   b) Explain stack organization in general purpose computer.   5

14 a) Explain instruction pipeline conflicts and their remedies.   6
   b) What is instruction level parallelism? Distinguish between the super scalar and super pipelined approaches.   4

15 a) Differentiate between synchronous and asynchronous data transfer. 3
    b) Explain DMA transfer in detail with relevant block diagram. 7

16 A digital computer has a memory unit of 64Kx16 and a cache memory of 1K words. The cache uses direct mapping with a block size of four words.
    a) How many bits are there in the tag, index, block and word fields of the address format? 4
    b) How many bits are there in each word of cache, and how are they divided into functions? Include a valid bit. 4
    c) How many blocks can the cache accommodate? 2

17 Write short notes on :
    a) Booths algorithm 4
    b) General purpose register CPU organization 3
    c) Memory hierarchy 3

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FACULTY OF ENGINEERING

B.E. 3/4 (Mech./AE) II-Semester (Supplementary) Examination, Nov. / Dec. 2016

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. Differentiate between thermal conductivity and heat transfer coefficient.
2. Define critical radius of insulation and give expressions for spheres.
3. Define sensitivity or time constant of a thermocouple.
4. State the conditions for "Lumped Heat" analysis.
5. Define and explain the significance of Reynolds number.
6. What is hydrodynamically developed flow?
7. Distinguish between absorptivity and emissivity.
8. Define Wein's displacement law.
9. State the advantages of NTU method.
10. State the assumptions for the "Filmwise condensation.

PART – B (50 Marks)

11. A pipe with OD 20 mm is covered with two insulating materials. The thickness of each insulating layer is 10mm. The conductivity of the first insulating layer is 6 times that of the second insulating layer. Initially, insulating layers are placed in the order of first and second layer. Then they are placed in the order of second layer and first layer. Calculate the percentage change in head transfer and increase (or) decrease in heat transfer. Assume a length of 1m. In both the arrangements, there is no change in temperature.

12. A cylindrical fin is attached to an outer surface of a furnace to transfer heat. The temperature of the outer surface is 30^0C. The diameter of the fin is 3cm and the length is 50cm. The temperature at the tip of the fin is 50^0C. Assume a convective heat transfer coefficient of 25 W/m^2–K. Calculate (a) the thermal conductivity of the cylindrical fin and b) the rate of heat transfer. Assume ambient temperature of 30^0C.

13. Air at a velocity of 50 m/s and at a temperature of 20^0C flows over a flat plate maintained at a uniform temperature of 140^0C. the local skin friction coefficient at a point on the plate is 0.004. Calculate a) the local heat transfer coefficient at that point b) the velocity boundary layer thickness at that point and c) the thermal boundary layer at that point. Assume that the given point is in laminar region.

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14 A pipe carrying steam having an outside diameter of 20cm runs in a large room and is exposed to air at a temperature of 30^0C. The pipe surface temperature is 400^0C. Calculate the loss of heat to surroundings per meter length of pipe due to thermal radiation. The emissivity of the pipe surface is 0.8. What would be the loss of heat due to radiation if the pipe is enclosed in a 40cm diameter brick conduct of emissivity 0.91?

15 An oil of CP = 2.6 kJ/kg-K is to be cooled by using a counter flow heat exchanger from 110^0C to 40^0C. The water is used to cool the oil. Water enters at 20^0C, the overall heat transfer coefficient is 1500 W/m^2-k. Water temperature is 75^0C. Calculate by NTU method the following   a) water flow rate,   b) the effectiveness of heat exchanger and   c) the surface required.

16 Saturated water at one atmospheric pressure is boiled by using a copper heating surface of 5 x 10^{-2} m^2. The heating surface is maintained at a temperature of 120^0C. Calculate   a) the surface heat flux and   b) the rate of evaporation.

17 Explain the following :
   a) Buckingham's   theorem
   b) Effectiveness and efficiency of a fin

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FACULTY OF ENGINEERING
B.E. 3/4 (Prod.) II - Semester (Suppl.) Examination, November / December 2016

Subject : Turbo Machinery

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 Classify various types of turbo machines.

2 What is priming and it's necessary.

3 Define unit speed, unit discharge and unit power with reference to Hydraulic Turbines.

4 What is the critical pressure ratio in steam nozzles?

5 Mention the essential difference between steam and gas turbine cycle.

6 Differentiate Propeller and Kaplan turbines.

7 Explain the Pressure compounding in steam turbines.

8 Draw the velocity triangle of a 50% reaction steam turbine.

9 Give the relation among the blade, nozzle and stage efficiencies of steam turbine.

10 Draw the Brayton cycle on P-V and T-S diagram.

PART-B (50 Marks)

12 Derive Euler's energy equation for flow through turbomachines.

13 a) Explain with a neat sketch the working of a centrifugal pump.
   b) Differentiate between Centrifugal & Axial flow Compressor.

14 A Pelton wheel has a mean bucket speed of 15 m/sec with a jet of water flowing at the rate of 1m^3/sec under a head of 4.2 m. The bucket deflects the jet through an angle of 165°. Calculate the power and the efficiency of the turbine. Assume co-efficient of velocity as 0.98.

15 Derive an expression for exit velocity for steam flow through a nozzle. Also obtain the relation for critical pressure ratio. Draw neat sketches.

16 Explain with neat sketch working of gas turbine plant with inter cooling, regeneration and reheating

17 Write short notes on the following
    (a) Losses in turbo machines.
    (b) Cavitation in Centrifugal pumps
    (c) Specific speed of a hydraulic turbines
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FACULTY OF INFORMATICS

B.E. 3/4 (I.T.) II – Semester (Suppl.) Examination, December 2016

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 Write any two reasons, why we go for the modelling.   (2)
2 Define any three applications of UML.   (3)
3 What is the difference between communication and synchronization?   (2)
4 What is the difference between patterns and frameworks?   (2)
5 What do you mean by basic behavioural modelling?   (3)
6 Difference between processes and threads.   (3)
7 What is a guard condition give example?   (2)
8 What are the stereotypes that apply to active class?   (3)
9 Define the following common mechanism in the UML   (3)
   a) Specifications
   b) Adornments
   c) Common divisions
10 What is trace relationship?   (2)

PART – B (5x10 = 50 Marks)

11. Explain the different types of things in the UML.   (10)

12 a) What is dependency relationship? Define the different stereotypes that apply to
       dependency relationship.   (5)
   b) Explain how unified software development process is use case driven process.   (5)

13. Explain steps in requirements capture with an example.   (10)

14 a) Define class and draw a class diagram for enrolling a student for a course in the
       University.   (5)
   b) Explain the Architecture of UML with a neat diagram.   (5)

15 a) Explain time and space. How do we specify timing constraints and location in
       behavioural modelling?   (5)
   b) What is forward and reverse engineering?   (5)

16 a) What is a collaboration and what are the structural and behavioural aspects of
       collaboration explain with an example.   (6)
   b) What is realization relationship? How is it related to collaboration?   (4)

17 a) Draw the state machine for the life time of an object.   (6)
   b) Explain the following states machines with an example.   (4)
       i)   History states
       ii) Concurrent substates.

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