

BTS-III-11.14-0943

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B

B.Tech. Degree III Semester Examination November 2014

IT/ME/EC/EB/EI 302 ELECTRICAL TECHNOLOGY (2006 Scheme)

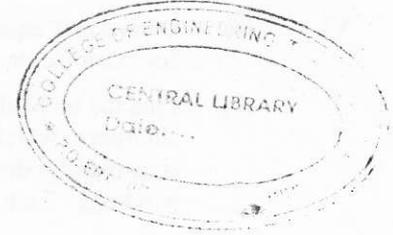
Time : 3 Hours

Maximum Marks : 100

PART A (Answer ALL questions)

(8 x 5 = 40)

- I. (a) Derive emf equation of transformer.
(b) Write short notes on current transformer, potential transformer, distribution transformer and power transformer.
(c) Briefly explain motoring action and generating action.
(d) Briefly explain the necessity of starters in dc motors.
(e) Explain why synchronous motor is not self starting.
(f) Briefly explain rotating magnetic field.
(g) Briefly explain the concept of load dispatching.
(h) Explain the term, Corona.



PART B

(4 x 15 = 60)

- II. A 20kva, 2500/250v, 50hz, single phase transformer gave the following test results: (15)
OC test (on L.V. side): 250v, 1.4A, 105w
SC test (on H.V side) : 104v, 8A, 320w
Obtain the following:
(i) the equivalent circuit referred to H.V. side
(ii) the equivalent circuit referred to L.V. side
(iii) regulation of transformer at half full load, 0.8 pf lagging load.
(iv) regulation of transformer at half full load 0.8pf. leading load.
(v) Secondary terminal voltage for case(iii)
(vi) Primary voltage required to be applied to get rated secondary voltage for case (iv)
(vii) Efficiency of transformer at ½ full load 0.8 pf lead.
(viii) The highest possible efficiency of the transform .
(ix) The load at which efficiency is 92% at upf.

OR

(P.T.O.)

- III. (a) Explain OC test and SC test of a single phase transformer. Explain how the equivalent circuit of the transformer can be determined from these tests. (8)
- (b) A 600v/220v, single phase transformer takes no load current of 2A at a pf of 0.2 lag. The transformer supplies a load of 30A at a pf of 0.9 lag. Calculate the current drawn by the primary from the mains and primary power factor. Neglect the winding resistance and reactance. (7)

- IV. (a) Explain the process of voltage build up in a dc shunt generator. (7)
- (b) Explain the term armature reaction as applied to dc machine. How its effect can be reduced. (8)

OR

- V. (a) Explain the speed torque characteristics of DC series motor. List out some of its applications. (7)
- (b) In a 220v compound generator, the resistance of armature, shunt and series windings are 0.1Ω , 50Ω and 0.6Ω respectively. The load consists of 220 lamps each rated at 100w and 220v. Find the reduced emf when the machine is connected as (i) long shunt (ii) short shunt. (8)

- VI. (a) Derive emf equation of an alternator, also explain distribution factor and coil span factor. (7)
- (b) Find the no load phase and line voltage of a star connected 3 phase, 6 pole alternator which runs at 1200 rpm, having flux per pole of 0.2 wb sinusoidally distributed. Its stator has 54 slots having double layer windings. Each coil has 6 turns and the coil is chorded by one slot. (8)

OR

- VII. (a) What is synchronous condenser? Explain. (7)
- (b) Why single phase induction motor is not self starting? Briefly describe the different methods to make the motor start. (8)

- VIII. Write short notes on: (15)
- (i) Overhead lines and underground cables.
 - (ii) Circuit breakers
 - (iii) Electrical insulators
 - (iv) Bus bars.

OR

- IX. (a) Draw the elementary diagram of a typical substation and explain function of each block. (10)
- (b) What are the advantages and disadvantages of hydel power plant over other plants? (5)

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D

B.Tech. Degree III Semester Examination November 2014

IT/CS 303 DISCRETE COMPUTATIONAL STRUCTURES (2006 Scheme)

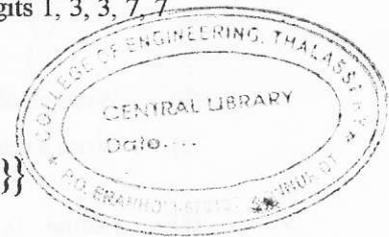
Time : 3 Hours

Maximum Marks : 100

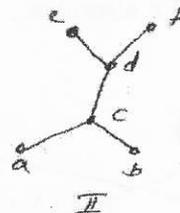
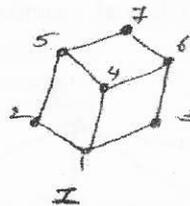
PART A (Answer ALL questions)

(8 x 5 = 40)

- I. (a) Prove that $(p \Leftrightarrow q)$ is logically equivalence to $(p \Rightarrow q) \wedge (q \Rightarrow p)$
- (b) Define equivalent relations? Give one example.
- (c) In how many ways can 6 men and 6 women be seated in a row if
- (i) any person may sit next to any other?
 - (ii) men and women must occupy alternate seats
- (d) How many distinct 4 digit integers can one make from the digits 1, 3, 3, 7, 7 and 8?
- (e) Draw the graph $G(V,E)$, where
 $V = \{a, b, c, d, e\}$ and
 $E = \{\{a, b\}, \{b, c\}, \{c, d\}, \{d, e\}, \{e, a\}, \{e, b\}, \{e, c\}, \{b, d\}\}$
- (i) Explain why it has no Euler cycle.
 - (ii) Find an Euler path.
- (f) Define monoid with example.
- (g) Let $*$ be the binary operation defined on a set of positive rational number (Q^+) such that $a*b = ab/3$.
- (i) Find identity element
 - (ii) Are the elements are invertible? If so find inverse of $a \in Q^+$?
- (h) Determine whether the posets shown in the figures are lattice or not. Explain why.



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PART B

- II. (a) Let $X = \{1, 2, 3, 4\}$. On X define a relation R by $(x, y) \in R$ if $x \leq y$ (5) (4 x 15 = 60)
- (i) Is R an equivalence relation or a partial order relation? Why?
 - (ii) Draw the digraph representing R .

(P.T.O.)

- (b) Prove that $(P \wedge (P \Rightarrow Q)) \Rightarrow Q$ is a tautology. (3)
- (c) Define $f: R \rightarrow R$ by $f(x) = 2x + 3$ (7)
- Show that f is bijective
 - Find f^{-1}
 - Sketch the graphs of f and f^{-1}

OR

- III. (a) A survey was conducted among 1000. Of these 595 like Metro channel, 595 like Star movies and 550 Zee TV. 395 of them like Metro channel and star movies, 350 of them like Metro channel and Zee TV and 400 of them like Star Movies and Zee TV, 250 of them like Metro channel, Star Movies and Zee TV. (8)
- (i) How many of them who do not like Metro channel, do not like Star Movies and do not like Zee TV?
- (b) Using the principle of induction prove that (7)
- $$1^2 + 3^2 + 5^2 + \dots + (2n-1)^2 = \frac{n(2n-1)(2n+1)}{3}$$

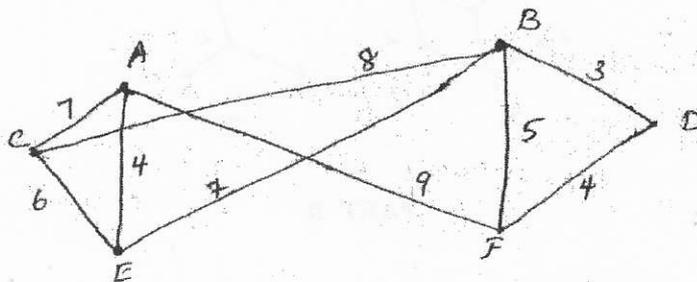
- IV. (a) In a shipment, there are 40 floppy disks of which 5 are defective. Determine in how many ways we can select (5)
- 5 floppy disks containing exactly 3 defective disks.
 - 5 floppy disks containing at least one defective disks.
- (b) Write an algorithm to check whether a give number is prime or not. (5)
- (c) Write a recursive algorithm to find gcd of 2 number. (5)

OR

- V. (a) Define O , Ω and θ notations. Explain the applications of each notations. (5)
- (b) Analyse linear search algorithm for the following three cases (10)
- best case
 - average case
 - worst case.
- VI. (a) Define Euler graph. Prove that a connected graph has an Euler trail if it has at most two vertices of odd degree. (8)
- (b) Define Hamiltonian path? Give one path that is Hamiltonian but not an Euler path. (7)

OR

- VII. Explain Kruskal's algorithm. Find minimal spanning tree using this algorithm. (15)



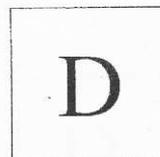
- VIII. Show that set of all non zero real numbers with binary operation $*$ defined by $a*b = ab/2$ is an abelian group. (15)

OR

- IX. Let $A = \{2, 7, 14, 28, 56, 84\}$ and $a \leq b$ if and only if a divides b . (15)
- Draw Hassc diagram from the POSET (A, \leq) .

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B. Tech. Degree III Semester Examination November 2014

IT/CS 304 OBJECT ORIENTED PROGRAMMING USING C++ (2006 Scheme)

Time: 3 Hours

Maximum Marks: 100

PART A (Answer *ALL* questions)

(8 x 5 = 40)

- I. (a) Differentiate class and object in object oriented programming.
(b) Describe the use of scope access operator (::) and reference operator (&).
(c) How are the public and private keywords different from each other?
(d) Define anonymous objects. Give examples.
(e) What is the use of virtual base class in inheritance?
(f) What do you mean by dynamic objects? How are they created?
(g) List the different types of file opening modes in C++ with their meaning.
(h) Explain the need of templates.



PART B

(4 x 15 = 60)

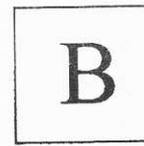
- II. (a) Discuss the key concepts of object oriented programming. (10)
(b) Give the advantages of new operator over malloc (). (5)
- OR**
- III. What is a function? Explain the three argument passing methods used in C++ functions with examples. (15)
- IV. (a) Write notes on friend functions and friend classes. (7)
(b) Write a C++ programme to exchange values between two classes using friend function. (8)
- OR**
- V. (a) Discuss the characteristics of constructors and destructors. (7)
(b) Write a programme to find the factorial of a number by calling the function recursively. (8)
- VI. (a) What is wild pointer? Explain the situations where a pointer become wild pointer. (7)
(b) What is 'this' pointer? Write a programme to find the largest of two numbers using 'this' pointer. (8)
- OR**
- VII. What are the different types of inheritance? Explain each type with examples. Give their merits and demerits. (15)
- VIII. (a) List any five string functions and their use with examples. (7)
(b) Write a programme to invoke the same function declared in both base and derived classes using virtual function. (8)
- OR**
- IX. (a) What do you mean by exception handling? Describe the role of try, catch and throw in exception handling. (7)
(b) Write a C++ programme that illustrate the application of multiple catch statements in exception handling. (8)

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B. Tech Degree III Semester Examination November 2014

IT 305 ELECTRONIC CIRCUITS AND LOGIC DESIGN (2006 Scheme)

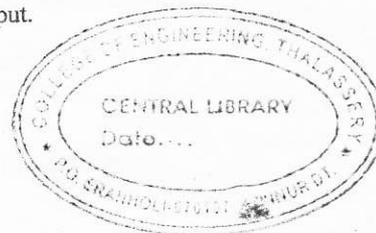
Time : 3 Hours

Maximum Marks : 100

PART A (Answer ALL questions)

(8 x 5 = 40)

- I. (a) Draw the high frequency model of BJT in CE configuration and explain.
- (b) Distinguish positive feedback and negative feedback.
- (c) Describe the working of a clamping circuit with sinusoidal input.
- (d) What do you mean by tunneling phenomenon?
- (e) Explain gray code and excess 3 code.
- (f) With logic diagram explain a 4:1 multiplexer.
- (g) With state table explain the conversion of JK to T flip flop.
- (h) Compare TTL and ECL logic families.



PART B

(4 x 5 = 60)

- II. Give the low frequency and high frequency analysis of CE amplifier. (15)
- III. (a) Explain the principles and operation of FET. Explain its characteristics and application. (10)
- (b) How are power amplifiers classified? (5)
- IV. Explain the construction, principle of operation and characteristics of UJT. Explain the working of UJT relaxation oscillator. (15)
- V. (a) Draw and explain the circuit of differentiator and integrator. Derive the expression for output voltage. (10)
- (b) Define CMRR. Explain the characteristics of an ideal op-amp. (5)
- VI. (a) Minimize using K map $f(A,B,C,D) = \sum m(0,2,6,10,11,12,13) + d(3,4,5,14,15)$ and implement it using NAND gate only. (9)
- (b) With truth table explain the realization of basic gates using universal gates. (6)
- VII. (a) What is a full adder? Design the circuit using NOR gate only. (10)
- (b) Explain the logic of binary multiplication, with example. (5)
- VIII. Design and implement a 3 bit Up-Down counter using JK flip flop and explain. (15)
- IX. (a) With neat circuit diagram, explain the logic working of 2 input TTL NAND gate. (10)
- (b) Write short notes on EPROM and EEPROM. (5)

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B. Tech. Degree III Semester Examination November 2014

IT 306 COMPUTER ORGANIZATION (2006 Scheme)

Time: 3 Hours

Maximum Marks: 100

PART A (Answer ALL questions)

(8 x 5 = 40)

- I. (a) Write a short note on assembler directives.
(b) What are the different notations used to represent an instruction?
(c) Explain prefetching and emulation.
(d) Explain bit pair recoding with example.
(e) Explain the working of a SRAM cell with a neat block diagram.
(f) Write a short note on memory interleaving.
(g) Explain vectored interrupts.
(h) Explain bus arbitration in DMA.



PART B

(4 x 15 = 60)

- II. (a) Write a short note on stack. (5)
(b) Explain the basic operational concepts of a computer. (10)
- OR**
- III. (a) Define a bus. What are the different types of buses? Compare different bus organizations. (10)
(b) Write a note on subroutines. (5)
- IV. (a) Explain hardwired control with a neat block diagram. (10)
(b) Write down the control sequence for the execution of the instruction. Add R_1, R_2 . (5)
- OR**
- V. Explain multiplication of two positive numbers with a neat block diagram and example. (15)
- VI. What is a cache memory? Explain the significance of cache memory. Explain different mapping functions. (15)
- OR**
- VII. Write a note on virtual memory. Explain address translation in detail. (15)
- VIII. (a) Explain the different mechanisms used for enabling and disabling interrupts. (9)
(b) Explain the methods for handling simultaneous interrupt requests. (6)
- OR**
- IX. Write a note on different I/O interface circuits. (15)

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