

Code No: RT32021

R13

SET - 1

III B. Tech II Semester Regular Examinations, April – 2016
MICROPROCESSORS AND MICROCONTROLLERS
(Electrical and Electronics Engineering)

Time: 3 hours

Maximum Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

PART -A

- 1 a) Specify the size of data, address, memory word and memory capacity of 8086 microprocessor [3M]
- b) What do you mean by masking the interrupt? Explain [4M]
- c) How is PUSH B instruction executed? Find the status after execution [4M]
- d) Write the function of OBF in 8255? [3M]
- e) List the on-chip peripherals of 8051 microcontroller. [4M]
- f) What is the difference between A/D and D/A converters? [4M]

PART -B

- 2 a) Draw the flag register of 8086 microprocessor. [4M]
- b) Discuss how pipelined architecture is implemented in 8086 [8M]
- c) List classification of signals in 8086 microprocessor. [4M]
- 3 a) Give two examples for logical and branch instructions of 8086. [4M]
- b) Draw the timing diagram for op-code fetch machine cycle and memory read machine cycle. [7M]
- c) Write an assembly language program to multiply two 16 bit numbers. [5M]
- 4 a) Write instructions to load hexadecimal numbers 61B4H in register C and 8245H in accumulator. Display the number 61B4H in port0 and 8245H in port1. [8M]
- b) List various assembler directives of 8086 microprocessor. [8M]
- 5 a) Draw the logical block diagram of 8279 keyboard display controller and explain. [8M]
- b) How data is transmitted in asynchronous serial communication? [8M]
- 6 a) Draw the pin Diagram of 8051 and explain the function of various signals. [10M]
- b) Explain addition and subtraction instructions of 8051. [6M]
- 7 a) Interface an 8×8 keyboard using 8255 ports and write a program to read the code of pressed key [8M]
- b) Quantify the number of register banks in 8051 and say how CPU knows which bank is currently in use. [8M]



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PART -A

- | | | |
|---|---|------|
| 1 | a) How the identified memory segment is accessed by 8086 microprocessor? | [3M] |
| | b) Differentiate between maximum mode and minimum mode of 8086. | [4M] |
| | c) List the alternative functions assigned to Port 3 pins of 8051 microcontroller | [4M] |
| | d) Discuss basic features of 8259 | [3M] |
| | e) Mention the I/O instructions of 8051 microcontroller. | [4M] |
| | f) What do you mean by quantization noise? | [4M] |

PART -B

- | | | |
|---|---|------|
| 2 | a) Discuss architecture of 8086 microprocessor. | [8M] |
| | b) List basic features of 80286 microprocessor. | [4M] |
| | c) List any two data manipulation instructions. | [4M] |
| 3 | a) Describe interrupt structure of 8086 microprocessor in brief. | [3M] |
| | b) Discuss about instruction format and different addressing modes of 8086. | [8M] |
| | c) Draw and explain timing diagram of memory write operation. | [5M] |
| 4 | a) What is an assembler directive? Explain following assembler directives. | [8M] |
| | (i) ORG (ii) DT (iii) GROUP (iv) SEGMENT (v) EQU | |
| | b) Write an ALP in 8051 to count number of positive and negative numbers from an array of 8-bit integers. | [8M] |
| 5 | a) With neat block diagram explain the functions of 8259 | [8M] |
| | b) Discuss the process of stepper motor interfacing. | [8M] |
| 6 | a) List the various instructions available in 8051 microcontroller. | [8M] |
| | b) Explain in detail the modes of operation of Timer unit in 8051 Microcontroller. | [8M] |
| 7 | a) How to interface a 7 segment display using 8051 microcontroller | [8M] |
| | b) What do you understand by bit addressable RAM in 8051 microcontroller? | [8M] |



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PART -A

- 1 a) If the stack segment register contains 3000h and stack pointer register contains 8434h, what is the physical address of the top of the stack in 8086 microprocessor? [3M]
- b) Define machine cycle [4M]
- c) Mention the size of DPTR and Stack Pointer in 8051 microcontroller [4M]
- d) Write advantages of PIC chips in microprocessor based systems. [3M]
- e) What are the addressing modes of 8051 microcontroller? [4M]
- f) Name any two types of A to D converters. [4M]

PART -B

- 2 a) List basic features of 80386 microprocessor. [4M]
- b) Draw the signal configuration of 8086 and explain the purpose of each signal. [8M]
- c) Discuss the similarities and differences between COMPARE and SUBTRACT instructions. [4M]
- 3 a) Draw the timing diagram of I/O read cycle. [3M]
- b) Discuss the addressing modes of 8086 with suitable examples. [8M]
- c) Describe with a suitable example, operation of a stack. [5M]
- 4 a) Compare macros and procedures with suitable examples. [8M]
- b) Give the assembly language implementation of the following: [8M]
 (i) FOR LOOP (ii) REPEAT (iii) IF-THEN-ELSE
- 5 a) Draw block diagram of 8255 and explain its modes of operation. [8M]
- b) Discuss the features of 8259 and 8279. [8M]
- 6 a) Write an 8051 ALP to find Fibonacci series of N numbers. [8M]
- b) Explain various types of jump instructions in 8051. [8M]
- 7 a) How do you interface a 4 × 4 matrix keyboard using 8051 microcontroller? [8M]
- b) Explain different methods of memory address decoding in 8051 microcontroller. [8M]



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PART -A

- 1 a) Why do we need look-up table? [3M]
- b) Define instruction cycle [4M]
- c) What is the operation of given 8051 microcontroller instructions: XRL A, direct? [4M]
- d) What is key debouncing? [3M]
- e) What are the different operations performed by boolean variable instructions of 8051? [4M]
- f) How much current is needed to drive an LED? [4M]

PART -B

- 2 a) Discuss the features of 80486 microprocessor [4M]
- b) Discuss in-detail about instruction set of 8086 microprocessor. [8M]
- c) What is instruction pipelining? [4M]
- 3 a) Compare the similarities and differences of CALL and RET instructions with PUSH and POP instructions. [3M]
- b) Write a program with a flowchart to multiply two 8-bit numbers. [8M]
- c) How address decoding is done in memory interface? Discuss. [5M]
- 4 a) What is the difference between Microprocessors and Microcontrollers? [8M]
- b) What is a MACRO? How do you pass parameters to MACRO's? [8M]
- 5 a) Make a comparison between parallel and serial type of data transfer. [8M]
- b) Show the control word format of 8255 and explain how each bit is programmed? [8M]
- 6 a) Write an 8051 ALP to find the average of N numbers. [8M]
- b) Explain the Data transfer instructions and Program control instructions of 8051 microcontroller. [8M]
- 7 a) Explain the interfacing of keyboard/display with 8051 microcontroller. [8M]
- b) Why do we need opto-isolator circuit between microcontroller and the stepper motor? [8M]



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OPERATIONS RESEARCH

(Mechanical Engineering)

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PART -A

- 1 a) Discuss the various phases in solving an OR problem. [4M]
 b) Explain the difference between a transportation problem and an assignment problem. [4M]
 Explain situations where an assignment problem can arise.
 c) Explain replacement situations giving an example for each of them. [3M]
 d) What do you understand by a queue? Give some important applications of queuing theory. [3M]
 e) Why is inventory maintained? Discuss it and give a classification of inventory models. [4M]
 f) What are the applications of dynamic programming problem? Explain. [4M]

PART -B

- 2 Max $Z=3x_1+2x_2+5x_3$ [16M]
 Subject to the constraints
 $x_1+2x_2+x_3 \leq 430$
 $3x_1+2x_3 \leq 460$
 $x_1+4x_2 \leq 420$ and $x_1, x_2, x_3 \geq 0$

- 3 a) Determine the optimal solution to each of the following degenerate transportation problem: [10M]

	D1	D2	D3	D4	D5	a_i
O1	4	7	3	8	2	4
O2	1	4	7	3	8	7
O3	7	2	4	7	7	9
O4	4	8	2	4	7	2
b_j	8	3	7	2	2	

- b) What is no passing rule in sequencing algorithm? Explain the principle assumptions made while dealing with sequencing problems. [6M]
- 4 a) A computer contains 10,000 resistors. When any one of the resistor fails, it is replaced. The cost of replacing a single resistor is Rs.10 only. If all the resistors are replaced at the same time, the cost per resistor would be reduced to Rs. 3.50. The percent surviving by the end of month t is as follows: [10M]

Month(t)	0	1	2	3	4	5	6
% surviving by the end of month	100	97	90	70	30	15	0

What is the optimum plan?



- b) Explain how the theory of replacement is used in the problem of replacement of items that fail completely. [6M]
- 5 a) Solve the following (2 x 4) game. [10M]

B

	I	II	III	IV
I	2	2	3	-1
II	4	3	2	6

- b) The XYZ company's quality control dept is managed by a single clerk, who takes on an average 5 minutes in checking parts of each of the machine coming for inspection. The machines arrive once in every 8 minutes on the average. One hour of the machine is valued at Rs15 and a clerk's time is valued at Rs.4 per hour. What are the average hourly queuing system costs associated with the quality control department? [6M]
- 6 a) A company uses annually 24,000 units of raw material which costs Rs. 1.25 per unit. Placing each order costs Rs. 22.50 and the carrying cost is 5.4% per year of the average inventory. Find the economic lot size and the total inventory cost (including cost of material). Should the company accept the offer made by the supplier of a discount of 5% on the cost price on a single order of 24,000 units? [10M]
- b) What are the objectives that should be fulfilled by an inventory control system? [6M]
- 7 a) What are the prerequisites for a problem to be solved by dynamic programming? [8M]
- b) A town contains six wards and they contain 170, 510, 640, 75, 250 and 960 houses respectively. Make a random selection of 8 houses using the tables of random numbers. Explain the procedure adopted by you. [8M]



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PART -A

- 1 a) What are the applications of OR? [4M]
b) Explain what you mean by a sequencing problem. [4M]
c) Explain the methodology of solving replacement problems. [3M]
d) Name a few applications of queuing in mechanical engineering. [3M]
e) What are the basic assumptions involved in EOQ concept? [4M]
f) Illustrate Bellman's principle of optimality with an example. [4M]

PART -B

- 2 a) Solve the following problem by Big-M method: [16M]

$$\text{Min } Z=5x_1+3x_2$$

Subject to the constraints:

$$2x_1+4x_2 \leq 12$$

$$2x_1+2x_2 = 10$$

$$5x_1-2x_2 \geq 10$$

$$\text{and } x_1, x_2 \geq 0$$

- 3 a) A company has six jobs which go through three machines X,Y and Z in the order XYZ. The processing time in minutes for each job on each machine is as follows: [10M]

		Job					
		1	2	3	4	5	6
Machine	X	18	12	29	36	43	37
	Y	7	12	11	2	6	12
	Z	19	12	23	47	28	36

What should be the sequence of the jobs?

- b) Write the LP formulation of a transportation problem. [6M]
- 4 a) A machine owner finds from his past records that the costs per year of maintaining a machine whose purchase price is Rs.6000 are as given below: [10M]

Year	1	2	3	4	5	6	7	8
Maintenance cost(Rs)	1000	1200	1400	1800	2300	2800	3400	4000
Resale price	3000	1500	750	375	200	200	200	200

Determine at what age is a replacement due?

- b) In a store customers arrive in a Poisson stream with mean 60 per hour. The service time is exponential with mean of 0.005 hours. How many clerks should be available if the expected waiting time in the system should be less than 10 minutes. [6M]

- 5 a) Use dominance principle to simplify the rectangular game with the following payoff matrix and then solve graphically. [10M]

Player A

		I	II	III	IV
Player B	1	18	4	6	4
	2	6	2	13	7
	3	11	5	17	3
	4	7	6	12	2

- b) Show how a game can be formulated as a linear programming problem. [6M]
- 6 Find the optimum order quantity for a product for which the price breaks are as follows: [16M]

Quantity	Unit cost(Rs)
$0 \leq q_1 < 500$	10.00
$500 \leq q_2$	9.25

The monthly demand for a product is 200 units, the cost of storage is 2% of unit cost and the cost of ordering is Rs.350.

- 7 a) Write a detailed note on applications of simulation in manufacturing systems. [8M]
- b) Distinguish between mathematical models and simulation models. [8M]



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PART -A

- 1 a) Discuss the characteristics and the limitations of OR. [4M]
b) State a transportation problem. When does it have a unique solution? Explain. [4M]
c) What are the situations which make the replacement of items necessary? [3M]
d) A game refers to a situation of business conflict. Discuss. [3M]
e) What are the assumptions of the basic inventory model? How does each affect the model? [4M]
f) What are limitations of dynamic programming problem? [4M]

PART -B

- 2 a) Solve the following LP problem graphically: [16M]
Minimize $Z = -6x_1 - 4x_2$
Subject to the constraints:
 $2x_1 + 3x_2 \geq 30$
 $3x_1 + 2x_2 \leq 24$
 $x_1 + x_2 \geq 3$ and $x_1, x_2 \geq 0$

- 3 a) A salesman has to visit five cities A,B,C,D and E. The distance (in hundred miles) between the five cities are as follows: [10M]

	A	B	C	D	E
A	---	7	6	8	4
B	7	---	8	5	6
C	6	8	---	9	7
D	8	5	9	---	8
E	4	6	7	8	---

If the salesman starts from city A and has to come city A, which route should he select so that the total distance travelled is minimum?

- b) What are the assumptions involved in job sequencing problems? [6M]
- 4 a) A factory has a large number of bulbs, all of which must be in working condition. The mortality of bulbs is given in the following table: [10M]

Week	1	2	3	4	5	6
Proportion of bulbs failing during	0.10	0.15	0.25	0.35	0.12	0.03

If a bulb fails in service, it costs Rs.3.50 to replace; but if all the bulbs are replaced at a time it costs Rs. 1.20 each. Find the optimum group replacement policy.

- b) What do you mean by “money value”? How do you count it? [6M]



- 5 a) Two competitors A and B are competing for the same product. Their different strategies are given in the following payoff matrix: [10M]

		Company B			
		I	II	III	IV
Company A	I	3	2	4	0
	II	3	4	2	4
	III	4	2	4	0
	IV	0	4	0	8

Use dominance principle to find the the optimal strategies.

- b) On an average 96 patients per 24-hour day require the service of an emergency clinic. Also on average, a patient requires 10 minutes of active attention. Assume that the facility can handle only one emergency at a time. Suppose that it costs the clinic Rs. 100 per patient treated to obtain an average servicing time of 10 minutes, and that each minute of decrease in this average time would cost Rs. 10 per patient treated How much would have to be budgeted by the clinic to reduce the average size of the queue from $1\frac{1}{3}$ to $\frac{1}{2}$ patient. [6M]
- 6 a) Find the optimal order quantity for a product for which the price breaks are as follows: [10M]

Quantity	$0 \leq q < 50$	$50 \leq q < 100$	$100 \leq q < 300$
Unit cost(Rs)	10.00	9.00	8.00

The monthly demand for the product is 200 units, the cost of storage is 25% of the unit cost and ordering cost is Rs. 20 per order.

- b) Distinguish between ABC and VED analyses. [6M]
- 7 Solve the following linear programming problem by dynamic programming: [16M]

Max $Z = 3x_1 + x_2$ subject to the constraints

$$2x_1 + x_2 \leq 6$$

$$x_1 \leq 2$$

$$x_2 \leq 4 \text{ and } x_1, x_2 \geq 0$$



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PART -A

- 1 a) What are the various types of OR models? Explain. [4M]
 b) What do you mean by non-degenerate basic feasible solution of a transportation problem? [4M]
 c) Discuss briefly the various types of replacement problems. [3M]
 d) What is a rectangular game? Define pure strategy and mixed strategy in a game. [3M]
 e) What are the advantages and disadvantages of having inventories? [4M]
 f) State and explain Bellman's principle of optimality in dynamic programming. [4M]

PART -B

- 2 a) Solve the following LP problem by two phase method: [16M]
 Max $Z=5x_1+8x_2$
 Subject to the constraints:
 $3x_1+2x_2 \geq 3$
 $x_1+4x_2 \geq 4$
 $x_1+x_2 \leq 5$ and $x_1, x_2 \geq 0$

- 3 a) We have five jobs each of which must go through two machines in the order AB, processing times are given in the table below: [8M]

Job No	1	2	3	4	5
Machine A	10	2	18	6	20
Machine B	4	12	14	16	8

Determine a sequence for the five jobs that will minimize the total elapsed time.

- b) Solve the following cost minimizing transportation problem. [8M]

	D1	D2	D3	D4	D5	D6	Available
O1	2	1	3	3	2	5	50
O2	3	2	2	4	3	4	40
O3	3	5	4	2	4	1	60
O4	4	2	2	1	2	2	30
Required	30	50	20	40	30	10	180

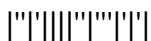
- 4 a) A truck owner finds from his past records that the maintenance costs per year of a truck whose purchase price is Rs. 8000, are given below: [10M]

Year	1	2	3	4	5	6	7	8
Maintenance cost(Rs)	1000	1300	1700	2200	2900	3800	4800	6000
Resale price(Rs)	4000	2000	1200	600	500	400	400	400

Determine at what time it is profitable to replace the truck.



- b) Explain with examples the failure mechanism of items. [6M]
- 5 a) A TV repairman finds that the time spent on his jobs has an exponential distribution with mean 30 minutes. If he repairs sets in the order in which they come in, and if the arrival of sets is approximately poisson with an average rate of 10 per 8 hour day, what is repairman's expected idle time each day? How many jobs are ahead of the average set just brought in? [8M]
- b) Two players A and B match coins. If the coin matches, then A wins one unit of value, if the coins do not match, then B wins one unit of value. Determine optimum strategies for the players and the value of the game. [8M]
- 6 a) An aircraft uses rivets at an approximately constant rate of 5,000 kg per year. The rivets cost Rs.20 per kg and the company personnel estimate that it costs Rs. 200 to place an order, and the carrying cost of inventory is 10% per year. [10M]
- (i) How frequently should orders for rivets be placed, and what quantities should be ordered for?
- (ii) If the actual costs are Rs. 500 to place an order and 15% for carrying cost, the optimum policy would change. How much is the company losing per year because of imperfect cost information?
- b) Discuss briefly various types of inventory models. [6M]
- 7 a) Discuss the various types of simulation models. [8M]
- b) Write a short note on the essential features of Simulation Languages. [8M]



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SOFTWARE ENGINEERING
(Computer Science and Engineering)

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PART -A

- | | | |
|-------|---|----|
| 1. a) | What is meant by Software and Software Engineering? | 3M |
| b) | Write short note on object oriented analysis. | 4M |
| c) | Explain design methodologies. | 4M |
| d) | Explain testing fundamentals. | 3M |
| e) | What are software metrics and measurements? | 4M |
| f) | Explain briefly about reengineering activities. | 4M |

PART -B

- | | | |
|-------|---|----|
| 2. a) | Explain briefly Software development lifecycle. | 8M |
| b) | Explain about evaluation of software engineering methodologies. | 8M |
| 3. a) | Write short note on Structured analysis. | 8M |
| b) | Explain briefly about requirements validation. | 8M |
| 4. a) | Briefly Explain Software design process. | 8M |
| b) | Write a short on structured design methodology. | 8M |
| 5. a) | Explain code verification. | 8M |
| b) | Write short note on regression testing. | 8M |
| 6. a) | Briefly explain software configuration management. | 8M |
| b) | Explain briefly about project size estimation. | 8M |
| 7. a) | What are software quality factors? | 8M |
| b) | What is software maintenance? Explain in detail. | 8M |



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PART -A

- | | | |
|-------|---|----|
| 1. a) | What is software process? Explain process classification. | 3M |
| b) | Write short note on requirements specification. | 3M |
| c) | Explain characteristics of good software design. | 4M |
| d) | Explain briefly about debugging approaches. | 4M |
| e) | Briefly explain project planning activity. | 4M |
| f) | What are the maintenance process models? | 4M |

PART -B

- | | | |
|-------|---|----|
| 2. a) | Explain applicability and advantages of software processes. | 8M |
| b) | What are the challenges of software engineering? | 8M |
| 3. a) | What are software requirements? How to analysis the requirements? | 8M |
| b) | Explain briefly about Requirements management. | 8M |
| 4. a) | What are the design principles? Explain in detail. | 8M |
| b) | Explain about structured design methodology. | 8M |
| 5. a) | Explain about white box testing? | 8M |
| b) | What are the principles of coding? | 8M |
| 6. a) | What are effort estimation techniques? | 8M |
| b) | Explain briefly about project management in detail. | 8M |
| 7. a) | Write a short note on capability maturity model. | 8M |
| b) | Briefly explain software reuse. | 8M |



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PART -A

- | | | |
|----|---|----|
| 1. | a) Explain briefly about software crisis. | 4M |
| | b) Write short note on requirement management process. | 3M |
| | c) What are the design principles of software? | 4M |
| | d) Explain black box testing. | 3M |
| | e) Explain briefly about software configuration management. | 4M |
| | f) What is verification and validation? Explain in detail. | 4M |

PART -B

- | | | |
|----|--|----|
| 2. | a) Explain Software development process models. | 8M |
| | b) Define software engineering. What are the challenges of software engineering? | 8M |
| 3. | a) Write short note on data oriented analysis. | 8M |
| | b) Explain briefly about requirements validation. | 8M |
| 4. | a) Write short note on structured design methodologies. | 8M |
| | b) Explain the concept of transform versus transaction analysis. | 8M |
| 5. | a) Explain coding documentation. | 8M |
| | b) Explain about usability testing. | 8M |
| 6. | a) What are essentials in project management? | 8M |
| | b) Explain briefly about project size estimation. | 8M |
| 7. | a) Explain the software quality assurance. | 8M |
| | b) What is reengineering? Explain in detail. | 8M |



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PART -A

- | | | |
|-------|--|----|
| 1. a) | What is software? What are the development lifecycle phases? | 4M |
| b) | Explain briefly requirements elicitation. | 4M |
| c) | Write short note on modular design. | 3M |
| d) | Explain about code documentation. | 3M |
| e) | Write short note on effort estimation techniques. | 4M |
| f) | What are differences between verification and validation? | 4M |

PART -B

- | | | |
|-------|---|----|
| 2. a) | Explain about evaluation of software engineering methodologies. | 8M |
| b) | What is the use of software development process models? | 8M |
| 3. a) | Explain prototyping analysis. | 8M |
| b) | Write short note on requirement engineering process. | 8M |
| 4. a) | What are the design methodologies? | 8M |
| b) | Explain about object oriented analysis and design principle. | 8M |
| 5. a) | What are the differences between black box and white box testing? | 8M |
| b) | What are the levels of testing? Explain in detail. | 8M |
| 6. a) | What is project management? Explain in detail. | 8M |
| b) | What are software metrics and measurements? | 8M |
| 7. a) | Explain the CMM model. | 8M |
| b) | What are the maintenance process models? | 8M |



Code No: **R32021**

R10

Set No. 1

III B.Tech II Semester Supplementary Examinations, April - 2016

ELECTRICAL MACHINE DESIGN

(Electrical and Electronics Engineering)

Time: 3 hours

Maximum Marks: 75

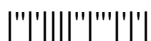
Answer any FIVE Questions

All Questions carry equal marks

- 1 a) What are the important design factors to be considered? Explain. [8M]
b) Explain about the different basic principles used in the design of electrical machines? [7M]
- 2 a) Explain the advantages of double layer windings in detail with the help of suitable diagrams. [7M]
b) Draw the winding diagram in radial form for a 2 pole, 12 slot simplex lap connected DC generator with commutator having 12 segments. Indicate the position of brushes. [8M]
- 3 a) Explain in detail about the choice of number of poles and choice of length air gap in DC machines. [7M]
b) Find the diameter and length of armature for a 8 kW, 4 pole, 1000 rpm, 200V shunt motor. Given: full load efficiency = 0.89; maximum gap flux density = 0.88 Wb/m^2 ; specific electric loading = 30000; field form factor = 0.8. Assume that the maximum efficiency occurs at full load and the field current is 3% of rated current. The pole face is square. [8M]
- 4 a) Compare core type and shell type transformer in detail. [7M]
b) Estimate the main dimensions including winding conductor areas of a three phase delta/star core type transformer rated at 300 kVA, 6000/400 V, 50 Hz. A suitable core with three steps having a circumscribing circle of 0.26m diameter and a leg spacing of 0.42m is available. The emf per turn is 10V. Assume a current density of 3 A/mm^2 , a window space factor of 0.3 and a stacking factor of 0.9. [8M]
- 5 a) Explain in detail about the determination of number of turns and length of mean turn of windings in transformers. [7M]
b) A 220/110 V, 1 kVA, 50 Hz single phase transformer has a core with a uniform cross sectional area of 2000 mm^2 , an effective magnetic core length of 0.3 m and a core weight of 7 kg. If the core is worked at a maximum flux density of 1.1 Wb/m^2 , the corresponding magnetizing force is 200 A/m and the specific core loss is 0.9 W/kg, determine (i) the transformer no load current when the HV side is fed at 220V
(ii) the corresponding magnetizing reactance. [8M]



- 6 a) What are the factors that will get affected while choosing specific electric and specific magnetic loadings in induction machines? [7M]
- b) Determine the approximate diameter and length of the stator core for a 10 kW, 400V, three phase, 4 pole 1425 rpm delta connected induction motor. Adopt a specific loading of 0.4 Wb/m^2 and a specific electric loading of 20000 A/m. Assume full load efficiency and power factor as 0.82 and 0.86 respectively. The ratio of core length to pole pitch is 1. The stator employs a double layer winding. [8M]
- 7 a) Explain in detail about the rotor design of squirrel cage induction motor. [7M]
- b) Explain in detail about the design of number of turns and area of rotor conductors in wound rotor induction motor. [8M]
- 8 a) What are the factors to be considered while designing the stator of synchronous machines? Explain. [7M]
- b) Find the main dimensions of a 2000 kVA, 187.5 rpm, 50 Hz, three phase 2.5 kV salient pole synchronous generator. The generator is to be vertical, water wheel type. The specific magnetic loading is 0.5 Wb/m^2 and the specific electric loading is 32000 A/m. Use circular poles with ratio of core length to pole pitch = 0.62. Specify the type of pole construction used if the runaway speed is about 2 times the normal speed. [8M]



Code No: **R32031**

R10

Set No. 1

III B.Tech II Semester Supplementary Examinations, April - 2016

METROLOGY

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 75

**Answer any FIVE Questions
All Questions carry equal marks**

- 1 a) Enumerate the desirable characteristics of precession measuring instruments.
b) Describe the different types of errors in measurement and their causes.
- 2 Explain the following angular measurement methods using rollers:
a) Measuring of included angles of an interval dove tail.
b) Measuring of angle by using rollers.
c) Measuring interior angle of a profile gauge.
- 3 a) What is optical projector? Explain.
b) Explain Michelson interferometers.
- 4 a) Explain with a neat sketch the working of Talysurf instrument for surface finish measurement.
b) What is the symbol for fully defining surface roughness and Explain each term?
- 5 Explain following comparators
a) Electrical
b) Electronic
c) Optical.
- 6 a) Explain about various errors in gear measurements.
b) Describe the measuring of gear tooth with vernier and flange micrometer.
- 7 a) Explain the errors in screw thread measurements.
b) What is best wire size? Explain about profile thread gauge?
- 8 a) Differentiate between Alignment test and Performance test.
b) Describe the Alignment test of a milling machine.



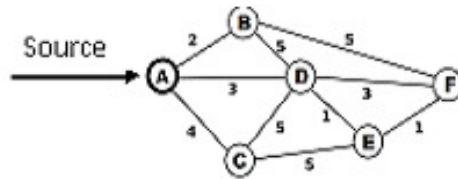
III B.Tech II Semester Supplementary Examinations, April - 2016
ADVANCED COMPUTER NETWORKS
(Common to CSE and IT)

Time: 3 hours

Max. Marks: 75

Answer any FIVE Questions
All Questions carry equal marks

- 1 a) Using Dijkstra's algorithm compute shortest path from router A to the [8]
 remaining nodes in the below network:



- b) Explain about i. Flooding and [7]
 ii. Registration procedure of new host in mobile routing.
- 2 a) What is classless addressing? Explain with example. [8]
 b) What is subnetting and supernetting? Explain with examples. [7]
- 3 a) Compare IPv4 and IPv6 headers in brief. [8]
 b) Write short notes on some of the IPv6 extension headers. [7]
- 4 a) Describe how SCTP handles flow control. [7]
 b) Discuss in brief about the following in relation with transport layer [8]
 i. Connection oriented service ii. Connection less service
 iii. Multiplexing iv. Demultiplexing
- 5 a) Explain how Leaky Bucket technique can be used for traffic shaping. [8]
 b) Elaborate on Backpressure and Choke Packet congestion control methods. [7]
- 6 a) Discuss the architecture of WWW along with client side and server side issues. [8]
 b) Give the Comparisons of SMTP and POP3 protocols. [7]
- 7 a) Write short notes on challenges and issues in MANETs. [8]
 b) State different real-time applications of Ad-hoc networks. [7]
- 8 a) Discuss the characteristics and addressing of Peer-to-Peer networks. [8]
 b) Write a short note on HTMLS. [7]
