

IV B.Tech I Semester Regular Examinations, November 2012
POWER SEMICONDUCTOR DRIVES
(Electrical & Electronic Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. With neat sketch and necessary waveforms explain how continuous current operation is obtained with single phase full controlled converter fed to D.C series drive. Also derive output current and voltage expressions. [16]
2. Derive the speed and torque expressions for a three phase fully controlled converter connected to a dc series motor. [16]
3. (a) Discuss in detail with suitable circuit diagrams and waveforms, the speed control operations of a separately excited d.c.motor using a circulating current dual converter.
 (b) A 230 Volts, 870 rpm, 100 A separately excited d.c.motor has an armature resistance of 0.05 ohm. It is coupled to an over hauling load with a torque of 400 N-m. Determine the speed at which motor can hold the load by regenerative braking. [8+8]

4. A 220V, 70A D.C series motor has combined resistance of armature and field is 0.12 ohms running on no-load with the field winding connected to a separate source. It gave following magnetization characteristics at 600 rpm

FieldCurrent(A)	10	20	30	40	50	60	70	80
TerminalVoltage (V)	64	118	150	170	184	194	202	210

Motor is controlled in regenerative braking by a chopper with a source voltage of 220V.

- (a) Calculate motor speed for a duty ratio of 0.5 and motor braking torque equal to rated motor torque.
 - (b) Calculate maximum allowable motor speed for a maximum permissible current of 70A and maximum permissible duty ratio of 0.95.
 - (c) What resistance must be inserted in armature circuit for the drive to run at 1000 rpm without exceeding armature current beyond 70 A? the duty ratio of the chopper has a range from 0.05 to 0.95.
 - (d) To What extent the number of turns in field winding should be reduced to run at 1000 rpm without exceeding armature current beyond 70 A? [16]
5. A 3ϕ , 4 pole, 50Hz SCIM has the following circuit parameters $r_1=0.05\Omega$ $r_2 = 0.09\Omega$, $x_1 + x_2 = 0.55\Omega$ The motor is star connected and rated voltage is 400v. It drives a load whose torque is proportional to the speed and is given as $T_1 = 0.05\omega$ NW-M. Determine the speed and torque of the motor for a firing angle of 45° of the AC voltage controller on a 400v, 50Hz supply. [16]

6. Discuss in detail how the variable frequency control of an Induction motor can be achieved using Current source Inverter. Mention the advantages and limitations of the above method. [16]
7. Draw the circuit diagram and explain the operation of rotor- resistance control using chopper. Mention the advantages and disadvantages of the above method of control. [16]
8. In variable frequency control of asynchronous motor why (V/f) ratio is maintained constant up to base speed and V constant above base speed. Draw the relevant characteristics. [16]

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1. Draw and explain the power circuit diagram of semi-converter feeding a separately excited D.C motor. Explain with typical voltage and current waveforms, the operation in continuous armature current Mode. [16]
2. Draw the circuit diagram and explain the operation of three phase, half wave converter drives. [16]
3. With a neat diagram, explain the operation of a dc drive in all four quadrants when fed by a single phase dual converter with necessary waveforms and characteristics. [16]
4. (a) Discuss with the suitable diagrams I quadrant and II quadrant choppers.
(b) A constant frequency TRC system is used for the speed control of dc series traction motor from 220v dc supply. The motor is having armature and series field resistance of 0.025Ω and 0.015Ω respectively. The average current in the circuit is 125A and the chopper frequency is 200Hz. Calculate the pulse width if the average value of back emf is 60 volts. [8+8]
5. An inverter supplies a six pole three-phase cage Induction motor rated at 415V, 50Hz. Determine the approximate voltages required of the inverter for motor speeds 600/800/1500/ 1800 rpm. [16]
6. A 440V,50Hz,4 pole 1420 rpm delta connected Induction motor has the following parameters.
 $R_s = 0.35 \text{ Ohm}$, $R_r' = 0.4 \text{ Ohm}$, $X_s = 0.7 \text{ Ohm}$, $X_r' = 0.8 \text{ Ohm}$. The motor is fed from a Voltage Source Inverter. The drive is operated at a constant (V/f) control upto 50 Hz and at rated voltage above 50 Hz.
Calculate the breakdown torques for a frequency of 75 Hz both for motoring and braking operations. [16]
7. Draw the circuit diagram and explain the operation of rotor- resistance control using chopper. Mention the advantages and disadvantages of the above method of control. [16]
8. Explain the principle of operation of separately controlled synchronous motor fed from VSI source. [16]

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1. Derive the Speed, Torque Equations of a fully controlled converter connected to separately excited D.C motor with continuous current operation with necessary waveforms. [16]
2. The speed of a 25 HP 380V 1800 rpm separately excited dc motor is controlled by a three phase semi controlled converter and is fed from a 415V, 50 hz supply .motor parameters are $R_a=0.9\Omega$, $L_a=10\text{mh}$. $K_a=50$.Calculate the speed of the motor at a torque of 50 Nm when the converter is fired at 45° .Neglect losses. [16]
3. With a neat diagram, explain the operation of a dc drive in all four quadrants when fed by a single phase dual converter with necessary waveforms and characteristics. [16]
4. Derive relation between Speed torque, duty ratio and armature current of a D.C series motor using chopper control under
 - (a) Motoring mode
 - (b) Regenerative braking. [16]
5. A 3 phase, 4 pole, 50 Hz Induction motor has rotor resistance of 0.2 ohm and stand still reactance of 0.1 ohm. At full load it operates at a slip of 4%. If the voltage is reduced to 50 %, at what speed will the motor operates with full load torque applied. [16]
6. Explain
 - (a) Why the variable frequency control is of Induction motor is more efficient than stator voltage control.
 - (b) Why the variable frequency control yields high torque to current ratio during starting. [8+8]
7. A 3 Phase,400V,50 Hz,10 KW 960 rpm, 6 pole star connected slip ring Induction motor has the following constants referred to the stator.
 $R_s = 0.4 \text{ Ohm}$, $R'_r = 0.6 \text{ Ohm}$, $X_s = X'_r = 1.4 \text{ Ohm}$. The motor drives a fan load at 960 rpm. The Stator to rotor turns ratio is 2.
 What resistance must be connected in each phase of the rotor circuit to reduce the speed to 800 rpm? [16]
8. (a) Why a self controlled mode is free from hunting oscillations?

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- (b) When operating in true synchronous mode, why the frequency must be changed in small steps? [8+8]



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1. Draw and explain the power circuit diagram of semi-converter feeding a D.C series motor. Explain with typical voltage and current waveforms, the operation in both continuous armature current Mode. [16]
2. (a) Explain how four-quadrant operation is achieved by dual converters each of 3 Φ full wave configuration for d.c. separately excited motor.
(b) Distinguish between circulating current and non-circulating current mode of operation. [8+8]
3. Explain the modes of operation of electric drive. [16]
4. (a) Discuss with the suitable diagrams I quadrant and II quadrant choppers.
(b) A constant frequency TRC system is used for the speed control of dc series traction motor from 220v dc supply. The motor is having armature and series field resistance of 0.025Ω and 0.015Ω respectively. The average current in the circuit is 125A and the chopper frequency is 200Hz. Calculate the pulse width if the average value of back emf is 60 volts. [8+8]
5. Discuss why the rotor of an Induction motor should have very large rotor resistance when it is controlled from a three phase ac voltage controller. [16]
6. A 3 Phase, 1500 rpm Induction motor is developing torque of 3000 Syn. watts at an input frequency of 50Hz. If the motor torque is now reduced to 1500 Syn.watts, determine the new value of stator frequency. The motor is operating in constant HP region. Assume constant rotor frequency and neglect effect of rotor resistance. [16]
7. Draw the circuit diagram and explain the operation of rotor- resistance control using chopper. Mention the advantages and disadvantages of the above method of control. [16]
8. Explain the principle of operation of self control of synchronous motor fed from VSI source. [16]

**IV B.Tech I Semester Regular Examinations, November 2012
OPERATIONS RESEARCH****(Comm to Mechanical Engineering and Automobile Engineering)****Time: 3 hours****Max Marks: 80****Answer any FIVE Questions
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1. (a) What are the applications OR techniques?
(b) Discuss the significance and scope of OR in modern management. [8+8]
2. (a) Explain the four elements that characterize a sequencing problem.
(b) Find the sequence that minimizes the total elapsed time (in hours) required to complete the following tasks. Each job is processed in the order ACB. [6+10]

Job:	1	2	3	4	5	6	7
Machine A:	12	6	5	11	5	7	6
Machine B:	7	8	9	4	7	8	3
Machine C:	3	4	1	5	2	3	4

3. It has been suggested by a data processing firm that a company adopts the policy of periodically replacing all the tubes in a certain piece of equipment. A given type of tube is known to have mortality distribution as shown in the following table:

Tube failures/week :	1	2	3	4	5
Probability of failure :	0.3	0.1	0.1	0.2	0.3

The cost of replacing the tubes on an individual basis is estimated to be Rs 1.00 per tube and the cost of group replacement policy average Re 0.30 per tube. Compare the preventive replacement with that of remedial replacement.

4. (a) Define:
 - i. competitive game,
 - ii. payoff matrix,
 - iii. pure and mixed strategies,
 - iv. saddle point,
 - v. optimal strategies, and
 - vi. rectangular (or two-person zero-sum) game.
- (b) What is a game in game theory? What are the properties of a game? Explain the 'best strategy' on the basis of minimax criterion of optimality. [8+8]
5. In a departmental store one cashier is there to serve the customers. And the customers pick-up their needs by themselves. The arrival rate is 9 customers for every 5 minutes and the cashier can serve 10 customers in 5 minutes. Assuming Poisson arrival rate and exponential distribution for service rate, find:

- (a) Average number of customers in the system.
(b) Average number of customers in the queue or average queue length.
(c) Average time a customer spends in the system.
(d) Average time a customer waits before being served. [16]
6. A T.V. dealer finds that costs of holding a television in stock for a week is Rs.20, customers who cannot obtain new television immediately tend to go to another dealer; and he estimates that for every customer who does not get immediate delivery he loses on an average Rs.200. For one particular model of TV, the probabilities for a demand 0, 1, 2, 3, 4 and 5 in week are 0.05, 0.1, 0.2, 0.2 and 0.15 respectively. How many televisions per week should the dealer order? [16]
7. Solve the following LPP by dynamic programming:
Maximum $Z = 3x_1 + 8x_2$,
Subject to
$$\begin{aligned} x_1 + 4x_2 &\leq 8, \\ x_2 &\leq 2, \\ x_1, x_2 &\geq 0. \end{aligned}$$
 [16]
8. Define simulation. Discuss about process of simulation. [16]

**IV B.Tech I Semester Regular Examinations, November 2012
OPERATIONS RESEARCH**

(Comm to Mechanical Engineering and Automobile Engineering)

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1. (a) What are the advantages of using linear programming.
- (b) A farmer has 100 acre farm. He can sell all tomatoes, lettuce, or radishes he can raise. The price he can obtain is Rs 1.00 per kg for tomatoes, Rs 0.75 a head for lettuce and Rs 2.00 per kg for radishes. The average yield per acre is 2000 kg of tomatoes, 3000 heads of lettuce and 1000 kgs of radishes. Fertilizer is available at Rs 0.50 per kg and the amount required per acre is 100 kgs each for tomatoes and lettuce, and 50 kgs for radishes. Labour required for sowing and harvesting per acre is 5 man-days for tomatoes and radishes, and 6 man-days for lettuce. A total of 400 man-days of labour are available at Rs 20.00 per man-day. Formulate this as a Linear-Programming model to maximize the farmers total profit. [6+10]
2. Consider the problem of assigning five operators to five machines. The assignment costs are given in figure 2.

	M_1	M_2	M_3	M_4	M_5
A	7	7	-	4	8
B	9	6	4	5	6
C	11	5	7	-	5
D	9	4	8	9	4
E	8	7	9	11	11

Figure 2

Operator A cannot be assigned to machine M3 and operator C cannot be assigned to machine M4. Find the optimum assignment schedule. [16]

3. (a) Discuss the various methods of depreciation an asset.
- (b) The cost of a machine is Rs. 6,100 and its scrap value is only. The maintenance costs are found from experience to be:

Year	1	2	3	4	5	6	7	8
Maintenance cost (Rs)	100	250	400	600	900	1,250	1,600	2,000

When should the machine be replaced? [6+10]

4. (a) Establish the relation between a linear programming problem and a two-person zero-sum game.

(b) Find the minimax and maxmin value of the following game : [8+8]

$$\begin{bmatrix} 1 & 3 & 6 \\ 2 & 1 & 3 \\ 6 & 2 & 1 \end{bmatrix}$$

5. A repair shop attended by a single mechanic has an average of 4 customers per hour who brings small appliances for repair. The mechanic inspects them for defects and quite often can fix them right away or otherwise render a diagnosis. This takes him 6 minutes on the average. Arrivals are Poisson and service time has the exponential distribution. You are required to

- (a) Find the proportion of time during which the shop is empty.
 (b) Find the probability of finding at least one customer in the shop.
 (c) The average number of customers in the system.
 (d) The average time, including service, spent by a customer. [16]

6. (a) Classify inventory.
 (b) Find the economic lot size, that associates with total cost and the length of time between two orders, given that the set-up cost is Rs.100, daily holding cost per unit of inventory is 5 paise and daily demand is approximately 30 units. [6+10]

7. A cosmetics manufacturing company is interested in selecting the advertising media for its product and the frequency of advertising in each media. The data collected over the past two years regarding the frequency of advertising in three medias of newspaper, radio and television and the related sales of the product gives the following table:

Frequency / week	Expected sales in thousands of rupees		
	Television	Radio	Newspaper
1	220	150	100
2	275	250	175
3	325	300	225
4	350	320	250

The cost of advertising in newspaper is Rs.500 per appearance, in radio and in television, Rs.1,000 and Rs.2,000 respectively per appearance. The budget provides Rs.4,500 per week for advertisement. Solve the problem for determining the optimal combination of advertising media and advertising frequency. [16]

8. Define simulation. Discuss about process of simulation. [16]

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OPERATIONS RESEARCH****(Comm to Mechanical Engineering and Automobile Engineering)****Time: 3 hours****Max Marks: 80****Answer any FIVE Questions
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1. (a) What is meant by a feasible solution of an LP problem?
- (b) A company produces two types of leather belts say A and B. Belt A is of superior quality and B is inferior. Profits on the two are 40 and 30 paise per belt, respectively. Each belt of type A requires twice as much time as required by a belt of type B. If all the belts were of type B, the company could produce 1000 belts per day. But the supply of leather is sufficient only for 800 belts per day. Belt A requires a fancy buckle and only 400 of them are available per day. For belt B only 700 buckles are available per day. Solve this problem to determine how many units of the two types of belts the company should manufacture in order to have a maximum overall profit? [6+10]
2. Consider the problem of assigning five operators to five machines. The assignment costs are given in figure 2.

	M_1	M_2	M_3	M_4	M_5
A	7	7	-	4	8
B	9	6	4	5	6
C	11	5	7	-	5
D	9	4	8	9	4
E	8	7	9	11	11

Figure 2

Operator A cannot be assigned to machine M3 and operator C cannot be assigned to machine M4. Find the optimum assignment schedule. [16]

3. (a) Explain how the theory of replacement is used in the following problems.
 - i. Replacement of items whose maintenance cost varies with time.
 - ii. Replacement of items that fail completely.
- (b) A large computer has 2000 components of identical nature which are subjected to failure as per the probability distribution given below :

Week end :	1	2	3	4	5
Probability of failure :	0.10	0.25	0.50	0.80	1.00

If the cost of individual replacement per unit Rs. 3 and for group replacement per unit is Re. 1, assess which of the replacement would be economical and when?

[6+10]

4. (a) What are the assumptions made in the theory of games?
 (b) Obtain the optimal strategies for both players and the value of the game for two-person zero-sum game whose payoff matrix is given in figure 4b. [8+8]

	Player <i>A</i>	Player <i>B</i>	
		<i>B</i> ₁	<i>B</i> ₂
	<i>A</i> ₁	-6	7
	<i>A</i> ₂	4	-5
	<i>A</i> ₃	-1	-2
	<i>A</i> ₄	-2	5
	<i>A</i> ₅	7	-6

Figure 4b

5. (a) Write about waiting lines.
 (b) A self-service store employs one cashier at its counter. Nine customers arrive on an average every 10 minutes while the cashier can serve 20 customers in 10 minutes. Assuming Poisson distribution for arrival rate and exponential distribution for service rate, find
- i. Average number of customers in the system.
 - ii. Average number of customers in queue or average queue length.
 - iii. Average time a customer spends in the system.
 - iv. Average time a customer waits before being served. [6+10]
6. An item is produced at the rate of 50 items per day. The demand occurs at the rate of 25 items per day. If the set-up cost is Rs.100 per setup and holding cost is 10 per item per day, find the economic lot size for one run, assuming that the shortages are not permitted. Also find the time of cycle and minimum total cost for one run. [16]
7. A manufacturing firm producing refrigerators has given a contract to supply 50 units at the end of the first month, 50 at the end of the second month, and 50 at the end of the third. The cost of producing 'X' number of refrigerators in any month is given by X^2 . The firm can produce more members of refrigerators in any month and carry them to the next month. However, a holding cost of Rs. 20 per unit is charged for any refrigerator carried over from month to the next. Assuming here is no initial inventory, determine the number of refrigerators to be produced in

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each month so as to minimize the total cost, using dynamic programming approach.
[16]

8. What is importance of simulation? Discuss about advantages and disadvantages of simulation.
[16]



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1. (a) Explain what is meant by degeneracy in LPP? How can these problems be solved?
- (b) Solve the following LP Problem by two phase method
 Maximize $Z = 5x_1 + 8x_2$
 subject to the constraints
- $$\begin{aligned} 3x_1 + 2x_2 &\geq 3 \\ x_1 + 4x_2 &\geq 4 \\ x_1 + x_2 &\leq 5 \\ x_1, x_2 &\geq 0. \end{aligned}$$
- [6+10]

2. A salesman travels from one place to another. He cannot, however, travel from one place to itself. The distances (in km) between pairs of cities are given in figure 2.

		To City			
		A	B	C	D
From City	A	-	15	25	20
	B	22	-	45	55
	C	40	30	-	25
	D	20	26	38	-

Figure 2

The problem is to chalk out a route which enables him to visit each of the cities only once, so that the total distance covered by him is minimum. [16]

3. (a) What are three strategies of replacement of items which follow sudden failure mechanisms? Explain each of them with examples.
- (b) The following failure rate have been observed for a certain type of light bulbs.

End of Week :	1	2	3	4	5	6	7	8
Probability of failure :	0.05	0.13	0.25	0.43	0.68	0.88	0.96	1.00

The cost of replacing an individual bulb is Rs. 2.25, the decision is made to replace all bulbs simultaneously at fixed intervals, and also to replace individual

bulbs as they fail in service. If the cost of group replacement is 60 paise per bulb and the total number of bulbs is 1,000, what is the best interval between group replacements? [6+10]

4. (a) Solve the game given in the figure 4 by reducing to 2×2 game by graphical method.
 (b) Define saddle point and value of the game. [10+6]

		Player B		
		I	II	III
Player A	I	4	-1	0
	II	-1	4	-2

Figure 4

5. On 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 decrease the average size of the queue formulation form 8 patients to 3 patients? [16]
6. (a) Discuss about significance of inventory.
 (b) A stockist purchases an item at the rate of Rs. 40 per piece from a manufacturer. 2,000 units of the item are required per year. What should be the order quantity per order if the cost per order is Rs.15 and the inventory charges per year are 20 per cent? [6+10]
7. Illustrate the multistage decision process with the help of the following allocation problem:
 A company has 8 salesmen, who have to be allocated to four marketing zones. The return of profits from each zone depends upon the number of salesmen working in that zone. The expected returns for different number of salesmen is different zones, as estimated from the past records, are given below. Determine the optimal allocation policy. [16]

No.of salesmen	Marketing zones			
	1	2	3	4
0	45	30	35	42
1	58	45	45	54
2	70	60	52	60
3	82	70	64	70
4	93	79	72	82
5	101	90	82	95
6	108	98	93	102
7	113	105	98	110
8	118	110	100	110

8. What is simulation? Discuss about application of simulation.

[16]



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WEB TECHNOLOGIES
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1. Explain the following terms related to HTML table:
 - (a) Cell padding and spacing
 - (b) Borders
 - (c) Formatting content in Table cells
 - (d) Nested tables. [4+4+4+4]

2.
 - (a) Compare and contrast HTML and DHTML.
 - (b) Write a javascript to validate a form consisting of a username. Also navigate to another web page after validation. [8+8]

3.
 - (a) Explain the Document object model tree structure. Also explain how XML DOM provides effective document manipulation.
 - (b) Create an XML schema for library information management. [8+8]

4.
 - (a) Explain the following given classes and their usage:
 - i. ParameterDescriptor
 - ii. PropertyChangeEvent
 - iii. PropertyEditorManager
 - iv. PropertyEditorSupport.
 - (b) Write about EJB. [8+8]

5.
 - (a) Write a program to demonstrate URL redirecting.
 - (b) Explain session tracking using Http Session. [8+8]

6.
 - (a) Write about the JSP processing.
 - (b) Explain the components of JSP. [8+8]

7.
 - (a) Explain how a server generates dynamic content.
 - (b) Give a note on request time errors. [8+8]

8. Create a web application for dynamic Frequently Asked Queries. The application should obtain the information to create the dynamic FAQ Web page from a database that consists of topics table and faq table. Topics table will have topic id, topic name faq table will have topic id, question, answer. [16]

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1. Explain the following terms related to HTML table:
 - (a) Cell padding and spacing
 - (b) Borders
 - (c) Formatting content in Table cells
 - (d) Nested tables. [4+4+4+4]

2. (a) Write a javascript to display the denomination of the amount deposited in the bank in terms of 100's, 50's, 20's, 10's, 5's, 2's & 1's. (Eg: If deposited amount is Rs.163, the output should be 1-100's, 1-50's, 1- 10's, 1-2's & 1-1's)
- (b) What is function? Explain how parameters are passed to functions in javascript. [8+8]

3. (a) Create a DTD for a catalog of four-stroke motorbikes, where each motorbike has the following child elements-*make, model, year, color, engine, chasis number* and *accessories*. The *engine* element has the child elements *engine number, number of cylinders, type of fuel*. The *accessories* element has the attributes like *disc brake, auto – start & radio*, each of which is required and has the possible values *yes* and *no*. Entities must be declared for the names of the popular motorbike makes.
- (b) Give the advantages and disadvantages of XML schemas. [8+8]

4. Take the *TickTock* Bean available in BDK, build an application which controls the *Colors* Bean. Develop the necessary code to exhibit the bound properties of java beans with the above mentioned beans. [16]

5. (a) Write a program to demonstrate URL redirecting.
- (b) Explain session tracking using Http Session. [8+8]

6. List and explain the attributes of the page directive. [16]

7. (a) Give a note on application scope.
- (b) Write a JSP with a Bean in the session scope. [8+8]

8. (a) Explain the functionality of JDBC package.
- (b) Discuss the JDBC architecture. [8+8]

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1. Create a HTML document that has five frames. There must be two rows of frames, the first with three frames and the other with two frames. The frames in the first row must have equal width. The left frame in the second row must be 50 percent of the width of the display. Each of the frames in the top row must display a document that has a form. The left top frame must have two test boxes, each 30 characters wide, labeled Name and Address. The middle top frame must have five radio buttons with color name labels. The right top frame must have four checkboxes, labeled with four kinds of car equipment such as a CD player and air conditioning. The two bottom frames must have images of two different cars. The top row of frames must use 20 percent of the height of the display. [16]
2. (a) Develop a javascript to generate 'ARMSTRONG NUMBERS' between the range of 1 to 1000. [Eg: 153 is an Armstrong number, since sum of the cube of the digits is equal to the number i.e., $1^3 + 5^3 + 3^3 = 153$]
(b) Describe the various String Objects with suitable examples. [8+8]
3. (a) Give the syntax of an XML document and explain how a basic XML document is created with an example.
(b) Explain the following terms related to Document Type Definition:
 - i. elements
 - ii. attributes & entities
 - iii. internal & external entities. [8+8]
4. Take the *TickTock* Bean available in BDk, build an application which controls the *Colors* Bean. Develop the necessary code to exhibit the bound properties of java beans with the above mentioned beans. [16]
5. What is a servlet? Explain lifecycle of a servlet. Illustrate with an example program. [16]
6. (a) What are the limitations of Servlets? How JSP over comes these Problems.
(b) Discuss about Tomcat Server. [8+8]
7. Discuss about implicit JSP objects in detail. Explain the scope of every JSP implicit object. [16]
8. Create a JSP to check the status of a bus ticket reservation from the server database. Status will be marked with a character- R- Reserved, W-waiting, C-cancelled. [16]

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1. Create a HTML document that has five frames. There must be two rows of frames, the first with three frames and the other with two frames. The frames in the first row must have equal width. The left frame in the second row must be 50 percent of the width of the display. Each of the frames in the top row must display a document that has a form. The left top frame must have two text boxes, each 30 characters wide, labeled Name and Address. The middle top frame must have five radio buttons with color name labels. The right top frame must have four checkboxes, labeled with four kinds of car equipment such as a CD player and air conditioning. The two bottom frames must have images of two different cars. The top row of frames must use 20 percent of the height of the display. [16]
2. (a) Create a javascript which has event handlers for the buttons “red”, “blue”, “green”, “yellow” and “orange” which must produce messages stating the chosen favorite color. The event handler must be implemented as a function, whose name must be assigned to the *onclick* attribute of the radio button elements. The chosen color must be sent to the event handler as a parameter.
(b) Insert an image into a web page. Write a script which displays a message when the mouse is over the image. The co-ordinates of the mouse should be displayed if click is attempted on the image. [8+8]
3. (a) With a suitable example explain the creation of namespaces in XML.
(b) Explain the various types of XML schema data types used. [8+8]
4. (a) What is BeanInfo Interface? Explain the importance of a BeanInfo Interface.
(b) Create a simple code which utilizes the BeanInfo interface effectively. [8+8]
5. Write a servlet that generates HTML page and explain the process of generation of HTML page. [16]
6. Give a note on the following:
 - (a) include directive
 - (b) forward action
 - (c) useBean action. [5+5+6]
7. Explain sharing session and application data with appropriate examples. [16]
8. Explain the process of getting/accessing metadata for a resultset. [16]

IV B.Tech I Semester Regular Examinations, November 2012
MICRO CONTROLLERS AND APPLICATIONS
(Common to Electronics & Communication Engineering and Bio-Medical Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Show interfacing mechanism that a 32 bit microcontroller can be used in image processing with an example. [16]
2. Write a program with assembly language to generate square wave. [16]
3. Narrate module coupling in interrupt service routine using 8051 interrupt structure. [16]
4. Narrate how you can program TINEO and TIMER1 in 8051C. [2×8]
5. A transducer interfaces an 8 bit ADC of an MCU and output to the LED display unit. Transducer generates 5mv/kmph car speed in an automobile. Lower limit of the car speed is Kmph and upper limit is 120kmph. The speed display is on four 7 segment LED display units: Draw the interface circuit for the above design and generate an assembly code to initialize the operation. [16]
6. (a) What is meant by context switching? Explain with an example
(b) Explain the Non-pre emptive multitasking technique with an example [8+8]
7. (a) List non-maskable and maskable interrupts in 80196
(b) Draw an interrupt vector table according to hardware priority of each source group. [8+8]
8. (a) Explain the registers available in different modes of ARM processor operation.
(b) Explain the pipeline structure of ARM 7. [8+8]

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1. Bring out the functional difference between microprocessors and microcontroller by drawing their basic block diagrams. [16]
2. Give any four examples for interrupt control flow instruction and explain. [4×4]
3. Discuss briefly nested interrupts. [16]
4. What are the steps involved in MODE1 programming and give an example? [16]
5. What do we mean by the bipolar mode of ADC? Discuss how the ADC results are stored in 8051 memory. What is the effect of finite word length of registers in microcontrollers. [16]
6. A multi-tasking system sends the message of 100 bits/minute at UART port(1 start+8data+1stop) at 1200 baud to a remote system. This message returns an identical message after 32ms if the remote system is good. List the tasks, which RTOS functions are used in this system [16]
7. (a) How is a watch dog timer used in 80196? How do we disable a watchdog timer feature in a program? When do we need to disable it?
(b) Explain PWM-control register of Intel 80196. How can we get a duty cycle of 25% at the PWM output using PWM-control? [8+8]
8. (a) Draw and explain the ARM core dataflow model.
(b) What are the various condition flags in ARM? [8+8]

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1. How do you do interface keyboard to the given 8051, give the block diagram also interface? [16]
2. Write a program to do all logical operations on any two numbers. [4×4]
3. (a) How do you access RAM locations 30-7FH as search pad?
(b) Write short notes on indexed addressing mode. [8+8]
4. (a) Find the timer's clock frequency and its period for various 8051-based systems with the following frequencies.
 - i. 8MHz
 - ii. 4MHz
 - iii. 16MHz.(b) Write about GATE in TMOD register. [8+8]
5. A transducer interfaces an 8 bit ADC of an MCU and output to the LED display unit. Transducer generates 5mv/kmph car speed in an automobile. Lower limit of the car speed is Kmph and upper limit is 120kmph. The speed display is on four 7 segment LED display units: Draw the interface circuit for the above design and generate an assembly code to initialize the operation. [16]
6. (a) What are the advantages of dividing an application into multiple tasks? What is a task control block?
(b) Explain the mailbox. Show how a task sends message to another task waiting for the message to start. Also show how a task sends a message pointer to another task waiting for that to start [6+10]
7. (a) How do we program bud rates during the UART functions in 80196?
(b) How do we program a software timer for an interupt after 4.096 ms in 80196 using a crystal of 12 MHz? [8+8]
8. (a) Explain the pipeline executing characterstics of ARM? Take an example ARM instruction sequence and explain?
(b) Explain the diffence between Exception handling & Interrupt handling in ARM. [10+6]

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1. (a) Write about capture registers.
(b) Write about control registers. [8+8]
2. (a) Write a program to add data in memory location and data in register.
(b) Write short notes on instruction set of 8051. [8+8]
3. (a) How do you access RAM locations 30-7FH as search pad?
(b) Write short notes on indexed addressing mode. [8+8]
4. Write short notes on the following:
 - (a) Free running counter.
 - (b) Interrupt interval. [2×8]
5. (a) A lookup table is used in the program "codekey". It uses 120 bytes to form a table for the valid keys. Write a subroutine using a series of "CJNE" instructions that will obtain the same result.
(b) When are the scan lines, encoded scan lines and return lines used? [8+8]
6. (a) Define task, task characteristics, task priority and task state
(b) Describe the RTOS functions in RTX5 tiny. [8+8]
7. (a) Explain the software times interrupt in 80196
(b) Justify the priority orders provided in 80196 for the maskable interrupts
(c) What are vector addresses for Interrupt servicing to timer 1 and timer 2 in Intel 80196? [5+5+6]
8. (a) What are the Thumb version load-store multiple instructions? Explain them with example.
(b) Explain how Thumb state changes to ARM state and vice versa. [8+8]
