

BE (Elect), sem-VIII, 2/5/15
Power Electronics Application & in power system
Bharatiya Vidya Bhavan's

Lib
02-05-15

SARDAR PATEL COLLEGE OF ENGINEERING

(an autonomous institution affiliated to university of Mumbai)
MUNSHI NAGAR, ANDHERI (WEST), MUMBAI -400 058

Total Marks : 100

Duration : 03 hr

CLASS/SEM : BE / VIII (Elect),

Subject: POWER ELECTRONICS APPLICATION IN POWER SYSTEM

NB: Answer any five Qs from Qs I to Qs VII

Any extra question answered (more than five) should be self cancelled.

Assume suitable data & draw neat diagrams wherever required

Master

Qs. I

- a. Explain Load balancing using passive elements (10)
b. Explain the basic operating principle & characteristic of STATCOM (10)

Qs. II

Explain:

- a. The concept of series capacitive compensation (05)
b. Effect of series capacitive compensation for a two-machine power system on;
(i) P- δ & Q- δ curves (10)
(ii) Stability margin (05)

Qs. III

For a two-machine power system with an ideal midpoint shunt reactive compensator, show that:

- a. The transmittable power increases significantly (10)
b. The transient stability margin increases substantially (10)

Qs. IV

- a. Explain, how power flow is controlled using OLTC operated as Voltage regulator & Phase Angle Regulator (10)
b. Compare the performance of TSSC & GTO controlled series capacitor (10)

Qs. V

Explain in detail, the control capabilities of UPFC (20)

Qs. VI

- a. Draw the equivalent circuit representation (define all the parameters used to represent the circuit) of a bipolar HVDC system with 6-pulse converters (04)

Explain:

- b. Combined rectifier – inverter characteristics (06)
c. Power flow reversal. (10)

Qs. VII

Explain the following (*any two*):

(20)

- a. Commonly used operating modes of SSSC
- b. Effect of source inductance on converter performance in HVDC system
- c. Indirect current Controlled Synchronous link converter Var Compensator
- d. Basic components of HVDC system & their function

BE (Elect), Sem-~~VIII~~, Re-edam, 17/6/15
Power Electronics Application in Power System.

L1b
17/06/15

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Master.

Qs. I

- Explain the operation of 6 pulse converter considering the effect of source inductance. (10)
- Explain performance of a symmetrical line on load with shunt compensation (10)

Qs. II Explain the following with neat diagrams & respective characteristics: (20)

- Thyristor Switched Capacitor & Thyristor Switched Reactor
- Thyristor Controlled Reactor
- Thyristor Switched Series Capacitor
- Thyristor Controlled Series Capacitor

Qs. III Explain how the real & reactive power flow control is achieved in power system (two machine system) using the following:

- STATCOM (10)
- SSSC (10)

Qs. IV

Explain the basic principle & control capabilities of Unified Power Flow Controller (UPFC) with neat Schematic / Single line / phasor diagrams. (20)

Qs. V

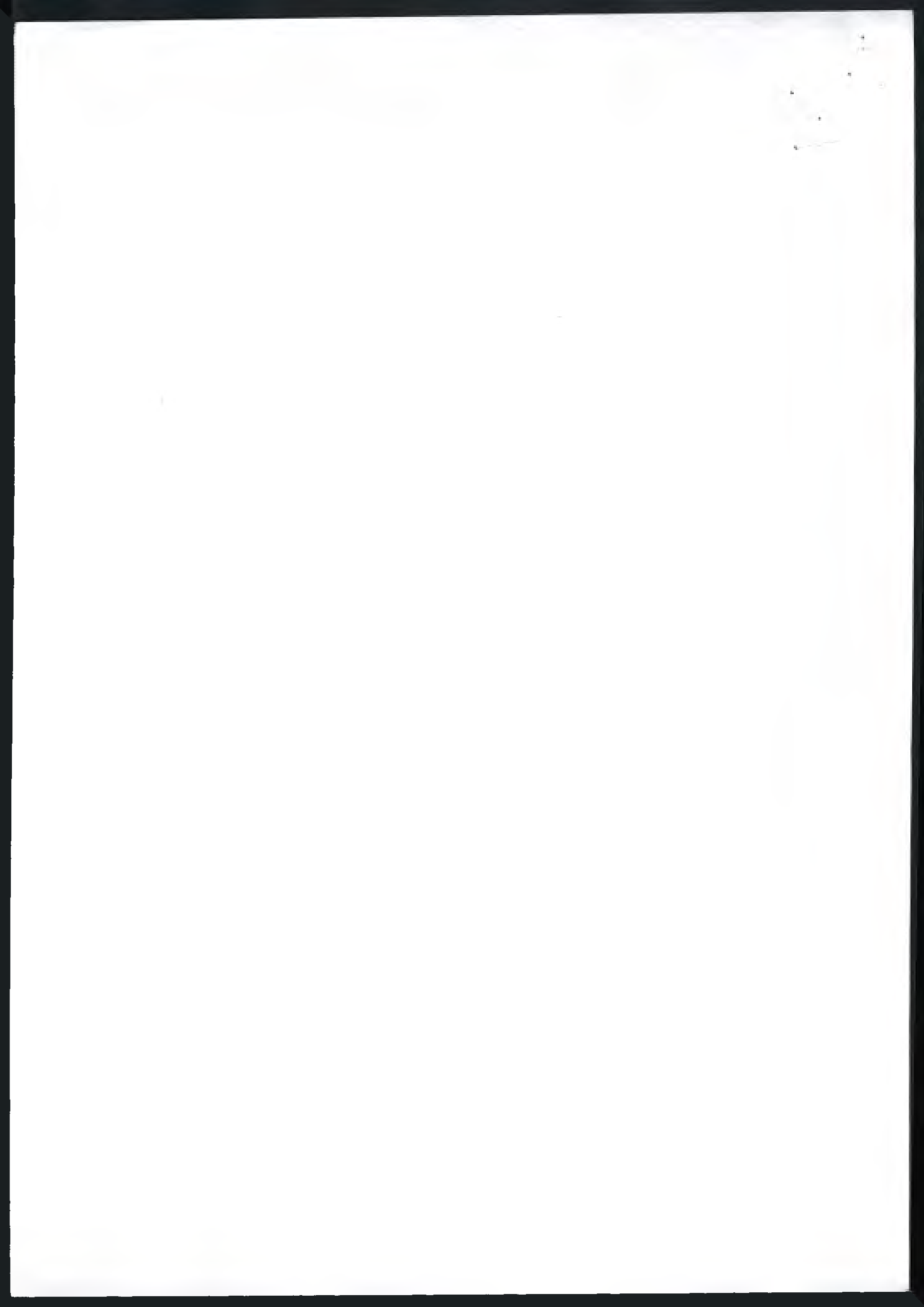
- Explain the control implementation of a two terminal HVDC link. (10)
- Explain various PWM techniques (10)

Qs. VI Explain the following with reference to HVDC systems:

- Power flow reversal (10)
- Mode stabilization & Voltage Dependent Current Order Limit (10)

Qs. VII Explain:

- HVDC light (10)
- Switching converter based Voltage & Phase Angle Regulators. (10)



BE (Elect), Sem-VIII, Re-exam 15/6/15
Electrical Drives & Control.

Bharatiya Vidya Bhavan's
SARDAR PATEL COLLEGE OF ENGINEERING

(An Autonomous Institution Affiliated to University of Mumbai)

First Half-2015
Re. Examination

Total Marks: 100

Duration : 3 Hours

CLASS/SEM B.E.(Electrical), Sem-VIII

SUBJECT : Electrical Drives & Control

- Attempt any FIVE question out of SEVEN questions
- Answers to all sub questions should be grouped together
- Figures to the right indicate full marks
- Assume suitable data if necessary and justify the same

Master

Q.1a) Explain the operation of three phase induction motor under unbalanced supply voltage condition. (10)

b) Discuss the steady state stability of a equilibrium point in an electrical drive system. (10)

Q.2a) Explain the need of closed loop speed control of dc shunt motor drive system. Draw the block diagram and explain important blocks. (12)

b) What is plugging operation of induction motor. Explain in brief with torque speed characteristics. (08)

Q.3a) A motor equipped with a flywheel has to supply a load torque of 600 N-m for 10 sec followed by a no load period long enough for the flywheel to regain its full speed. It is desired to limit the motor torque to 450 N-m. What should be the moment of inertia of the flywheel?. The no load speed of the motor is 600 rpm and it has a slip of 8 % at torque of 400 N-m. Assume the motor speed-torque characteristics to be a straight line in the range of operation. Motor has an inertia of 10 kg-m². (10)

b) Compare the status of ac and dc drives. (06)

c) What are the difficulties in implementation of regenerative braking of dc series motor. (04)

Q.4a) Explain multi-quadrant operation of low speed hoist. (12)

b) Explain the dynamic braking operation of Induction Motor. (08)

Q.5a) Explain the Dual Converter in circulating current mode. (10)

b) Compare the active and passive load torques with suitable example. (06)

c) What are the reasons for using load equalization in an electrical drive. (04)

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Electrical Drives & Control.

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Q.6a) What is the need for the starting arrangement required for three phase induction motor. Discuss the soft starting and rotor resistance control methods employed in three phase induction motor. (10)

b) Explain the motoring and braking operation of dc shunt motor using chopper with suitable circuit diagram and voltage and current waveforms. (10)

Q.7a) A separately excited dc motor is controlled by single phase fully controlled rectifier. Draw the circuit and explain the operation of continuous and discontinuous mode of operation with suitable output voltage and current waveforms. (12)

b) Explain the constant torque and constant power operation of induction motor drive using V/F control. (08)

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Date
27/04/15

Bharatiya Vidya Bhavan's SARDAR PATEL COLLEGE OF ENGINEERING

(An Autonomous Institution Affiliated to University of Mumbai)

BE (Elect), sem - VIII

Electrical Drives & Control,

First Half-2015

End Sem. Examination

Total Marks: 100

Duration : 3 Hours

CLASS/SEM : B.E.(Electrical) Sem-VIII

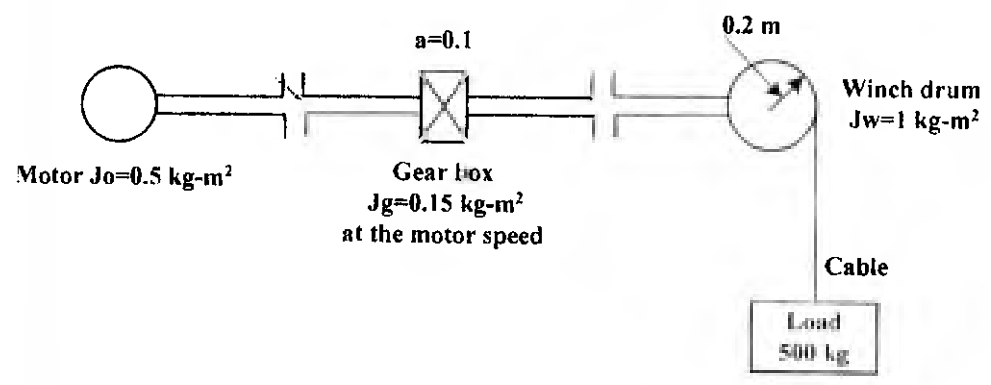
SUBJECT : Electrical Drives & Control

- Attempt any FIVE question out of SEVEN questions
- Answers to all sub questions should be grouped together
- Figures to the right indicate full marks
- Assume suitable data if necessary and justify the same

Master file

Q.1a) What are the reasons for unbalanced source voltages. Discuss the operation of three phase induction motor with unbalanced source voltages. Justify the reasons for the pulsating components in the torque developed by the motor. (12)

b) In Fig. shown below, the motor drives the winch drum through a reduction gear with a gear ratio of 0.1. The friction torque at winch shaft is 15 N-m and at motor shaft is 10 N-m. Motor speed is 1500 rpm. Calculate the equivalent moment of inertia of the drive referred to motor shaft and motor torque if gears have an efficiency of 90%. (08)



Q.2a) Derive an equivalent circuit for the dc dynamic braking of an induction motor and explain why it is necessary to account the saturation in the magnetic circuit. (10)

b) A three phase, 5 kW, 50 Hz, 4 pole star connected squirrel cage induction motor has the following parameters: $R_f' = 3 \text{ ohm}$, $X_r' = 4 \text{ ohm}$.

Following are three points on the magnetization characteristics with three lead connection (one phase in series with two other phases in parallel)

I_m, Amp.	0.898	2.86	8.2
E, V	74	199	201

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Electrical Drives & Control.

Calculate the dc dynamic braking torque, speed and rotor current for the above three values of I_m , when three lead connection is used and dc line current is 12 A. (10)

Q.3a) A three phase, 100 kW, 6 pole, 960 rpm wound rotor induction motor drives a load whose torque varies such that a torque of 3000 N-m of 10 sec duration is followed by a torque of 500 N-m of duration long enough for the motor to attain steady state speed. Calculate the moment of inertia of the flywheel, if motor torque should not exceed twice the rated value. Motor has inertia of 10 kg-m². Motor has a linear speed-torque curve in the region of interest. (10)

b) Compare the conventional and static Ward Leonard control of dc drives. (06)

c) What are the difficulties in implementation of regenerative braking of dc series motor. (04)

Q.4a) Explain the multi-quadrant operation of high speed hoist. (10)

b) Explain reasons for the starting arrangements employed for three phase induction. Discuss any two. (10)

Q.5a) For the four quadrant operation of separately excited DC motor drive, suggest the suitable power electronics converter. Explain the operation of converter for the speed reversal of the drive. (10)

b) Describe the dynamic braking operation of separately excited DC shunt motor using dc-dc converter. (06)

c) What are the reasons for using load equalization in an electrical drive. (04)

Q.6a) Describe the power electronics control of separately excited dc shunt motor using DC-DC converter in motoring and regenerative braking mode. (08)

b) A dc shunt motor has an armature resistance of 0.2 ohm and field winding resistance of 120 ohm. Following magnetization characteristics was measured at 1000 rpm.

Field current, (A)	0.2	0.3	0.4	0.5	0.75	1	1.5	2.0
Back emf, (A)	80	120	150	170	200	220	245	263

Motor is holding an overhauling load of 50 N-m by self-excited dynamic braking with a braking resistance of 10 ohm. Calculate the motor speed. (12)

Q.7a) Explain the implementation of V/F control of three phase induction motor in closed loop. (12)

b) A 400 V, 50 Hz, 4 pole, 1370 rpm, star connected 3 phase squirrel-cage induction motor has following parameters referred to stator: $R_s=2$ ohm, $R_r'=3$ ohm, $X_s= X_r'=3.5$ ohm. (08)

Calculate:

(i) Speed for a frequency of 30 Hz and 80% of full load torque.

(ii) Frequency for a speed of 1000 rpm and full load torque.

(iii) Torque for a frequency of 40 Hz and speed of 1100 rpm

BCEI (Elect), Sem - VIII,
Communication Networks & Security.

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29-4-15.

Bharatiya Vidya Bhavan's
SARDAR PATEL COLLEGE OF ENGINEERING
(Government - Aided Autonomous Institute Affiliated to university of Mumbai)

Total Marks: 100

Duration: 3 Hours

CLASS - B.E. Electrical, SEM - VIII, 2014-15

Subject: Communication Network & Security

- Attempt any five question from this paper.
- Make suitable assumptions if necessary and state them clearly.
- Draw neat sketches where necessary and show all supporting calculations.

Master

- Q.1 Answer the following questions (20)**
- a) Explain layered architecture of OSI model. (10)
 - b) Explain layered architecture of Bluetooth core protocol stack. (10)
- Q.2 Answer any two (20)**
- a) Explain mobile IP. What is agent solicitation and agent advertisement? (10)
 - b) Describe indirect TCP and snooping TCP in detail. (10)
 - c) Explain design criteria of DES (Data Encryption Standard) structure. (10)
- Q.3 Answer the following questions (20)**
- a) What is Asynchronous Transfer Mode (ATM) network? How VPI (Virtual Path Identifier) and VCI (Virtual Channel Identifier) are used for switching the cells, explain with diagram? (10)
 - b) What is Frame Relay? Explain significance of DTE (Data Terminal Equipment), DCE (Data Circuit-terminating Equipment) and DLCI (Data Link Connection Identifiers) in Frame Relay operation? (10)
- Q.4 Answer any two (20)**
- a) Define Wireless Local Area Network (WLAN)? Compare three principal WLAN technologies: IEEE 802.11a, IEEE 802.11b and IEEE 802.11g? (10)
 - b) What is Wireless Sensor Network (WSN)? Explain components of sensor node in WSN with neat diagram. What are the applications of WSN? (10)
 - c) What is Power Aware Routing (PAR)? Explain hidden terminal and Exposed terminal problem in MAC (Medium Access Control). How this problem can be solved? (10)
- Q.5 Answer the following questions (20)**
- a) Explain DSDV (Destination Sequenced Distance Vector) routing and OLSR (Optimized Link State Routing) with neat diagrams? (10)

BE (Elect), Sem- VIII, 20/4/15

Communication Network & Security.

- b) What is reactive routing? Explain AODV (Ad-hoc On Demand Distance Vector) routing with neat diagram? What are its advantages over DSR (Dynamic Source Routing)? (10)

Q.6 Answer the following questions (20)

- (a) Explain Public Key Cryptography? How public key encryption is different from conventional encryption? (10)

- (b) Given two prime numbers p and q , such that $p=3$ and $q=11$. By using RSA algorithm, find public key and private key. If message $M=2$ is to be communicated then form encrypted message and decrypted message equations. (10)

Q.7 Answer any two (20)

- (a) Explain four types of transformation process in AES (Advanced Encryption Standard) (10)
- (b) Explain working of digital signature? What are the advantages of digital signature? (10)
- (c) What is PGP (Pretty Good Privacy)? Explain working of PGP for e-mail security? (10)

BECElect), Sem - VIII, 5/5/15

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05/05/15

Smart Grid

BHARARATIYA VIDYA BHAVAN'S

SARDAR PATEL COLLEGE OF ENGINEERING

Munshi Nagar Andheri (West), Mumbai 400 058

(An Autonomous Institution Affiliated to University of Mumbai)

End Sem Examination

CLASS/SEM: BE (Electrical)/ VIII

Subject: Smart Grid

Total Marks: 100

Duration : 3 hour

Date : 05/05/2015

- Attempt any 5 questions.

Master

Q.1	A) Explain the need and applications of microgrid.	(10)
	B) Explain any five issues of interconnection of microgrid with the main grid.	(10)
Q.2	A) With relevant description enlist anticipated benefits of smart grid.	(10)
	B) What are the functions of smart grid? (Any 10)	(10)
Q.3	Write brief notes on following. A) Smart meters B) Smart appliances C) PHEV D) Home and building automation	(20)
	A) Explain any five applications of IED. B) What are the applications of SMES for power quality improvement?	(10) (10)
Q.5	A) What are the power quality issues and disturbances in the smart grid environment? B) Write a note on power quality conditioning devices for smart grid.	(10) (10)
	A) Explain the concept of cloud computing and cyber security for smart grid. B) Explain the construction and working of fuel cells, with the help of neat graphs explain its use in smart power grid.	(10) (10)
Q.7	Write brief notes on following. A) AMI B) HAN C) NAN D) WAN	(20)

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