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Code No. : 7213

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.E. I Year (EEE) II-Semester (Main) Examinations, July-2016**  
**(Power Systems & Power Electronics)**

**Machine Modelling and Analysis**

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE from Part-B*

**Part-A (10 × 2=20 Marks)**

1. Draw the diagram of an elementary 2-pole dc machine.
2. Draw the equivalent circuit of a compounded DC Machine.
3. What are the differences between permanent magnet dc machine and shunt connected dc machine?
4. What is Kron's transformation?
5. Derive a transformation that yields only constants when  $\omega = \omega_e$  for a balanced three phase set with a phase sequence of acb.
6. Explain about various reference frames.
7. Draw the winding arrangement of elementary two pole, two phase and symmetrical induction machine.
8. Derive the relationship that can be used to convert a per unit impedance from one VA base to another.
9. Is it possible to apply change of variables to rotor variables of salient pole synchronous machine? Explain.
10. What do you mean by time varying inductance?

**Part-B (5 × 10=50 Marks)**

*(All bits carry equal marks)*

11. a) Discuss the energy relations in an electromechanical system.  
b) How do you evaluate the total energy stored in the coupling field for a singly excited system?
12. a) How would you develop the mathematical model of DC shunt machine?  
b) Draw the Time domain block diagram of DC shunt machine using State variable equations.
13. a) With necessary equations draw arbitrary reference frame equivalent circuit for three phase resistive elements  
b) With necessary equations draw arbitrary reference frame equivalent circuit for three phase inductive elements.
14. a) Obtain the voltage equations of induction machine in arbitrary reference frame variables in terms of flux linkages.  
b) Develop the equivalent circuit diagram of an induction machine using voltage equations in arbitrary reference frame variables.

Contd...2

15. a) Obtain the stator voltage equations of three phase Synchronous machine in Arbitrary Reference frame Variables.  
b) Develop the equivalent circuit diagram of three phase Synchronous machine in Arbitrary Reference frame Variables.
16. a) Derive the torque equation of a Kron's primitive machine.  
b) Explain the steady state analysis of a DC Series motor.
17. Write short notes on any **two** of the following:
  - a) Transformation between reference frames.
  - b) Arbitrary reference frame.
  - c) Dynamic performance of Induction machine.

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Code No. : 7212

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.E. I Year (EEE) II-Semester (Main) Examinations, July-2016**  
(Power Systems & Power Electronics)

**Power Electronics Controlled Electric Drives**

Time: 3 hours

Max. Marks: 70

Note: Answer ALL questions in Part-A and any FIVE from Part-B

**Part-A (10 × 2=20 Marks)**

1. Define Commutation of thyristors.
2. Compare VSI and CSI.
3. Discuss current limit control strategy.
4. List the methods to improve the performance of a dc drive.
5. Draw the schematic block diagram of static Kramer drive.
6. Write the two major limitations of the stator voltage control of 3-phase induction motor using phase control technique.
7. What is the importance of microprocessor based drives?
8. Define step angle and give the formula for calculation of step angle.
9. Explain the working principle of brushless dc motor drive in brief.
10. List the various speed control schemes of switched reluctance motor drive.

**Part-B (5 × 10=50 Marks)**

11. a) State and explain the functions of various power electronic converters. [5]  
b) Explain the basic principle of operation of a cycloconverter with a neat circuit diagram. [5]
12. a) With the help of circuit diagram, Explain the steady state analysis of a separately excited dc motor. [6]  
b) A 220V, 1500 rpm, 10A separately excited dc motor is fed from a single phase fully controlled rectifier with an ac source voltage of 230V, 50Hz. The armature resistance is  $2\Omega$  and current conduction is continuous. Calculate the firing angle for rated motor torque at 1000 rpm. [4]
13. a) Draw and explain the speed – torque characteristics for a chopper controlled induction motor. [5]  
b) A 4-pole, 50 Hz, 3-phase induction motor has a chopper controlled resistance in the rotor circuit for speed control. Load torque is proportional to  $\omega^2$ . When the thyristor is ON the torque is 30 N-m at a slip of average 0.03. If  $\frac{T_{on}}{T_{off}} = 1$ , determine the average torque and speed. The motor develops a torque of 80% of ON torque. When the thyristor is OFF the speed variation down to 1200 rpm from synchronous speed. Determine  $\frac{T_{on}}{T_{off}}$  to give an average torque of 25 N-m. [5]
14. a) With the help of block diagram, Explain the microprocessor based firing scheme for dual converter. [6]  
b) Explain the operation of 2-Phase, 4/2 pole permanent magnet stepper motor. [4]

Contd...2



15. a) Explain the speed – torque characteristics of switched reluctance motor drive. [5]  
b) Draw and discuss the control schemes of brushless dc motor drive. [5]
16. a) Explain the operation of self commutated inverter circuit with the help of a neat circuit diagram. [5]  
b) Explain briefly about the Regenerative braking for dc motors. [5]
17. Write short notes on any **two** of the following
- a) Advantages of variable frequency induction motor drives. [5]  
b) Microprocessor based speed control of synchronous motor drive. [5]  
c) Constructional details of Brush less DC motor. [5]

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**VASAVI COLLEGE OF ENGINEERING (*Autonomous*), HYDERABAD**  
**M.E. I Year (ECE) II-Semester (Main) Examinations, July-2016**  
 (Communication Engineering & Signal Processing)  
**Wireless Communications and Networking**

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE from Part-B*

**Part-A ( $10 \times 2=20$  Marks)**

1. Define Coherence bandwidth and coherence time.
2. List out features of OFDM.
3. Give the merits of GSM.
4. Differentiate wired and wireless networks.
5. Given a 2-branch selection combining system operated with independent Rayleigh fading, calculate the diversity gain for a probability of  $10^{-6}$ .
6. Write about Jackes channel model.
7. Define frequency reuse.
8. Distinguish between diversity gain and antenna gain.
9. Briefly explain about scatternet in Bluetooth.
10. A Rake receiver is used in the wideband CDMA system with a spreading rate of 3.84 Mcps to reduce the multipath effect in the channel. What is the minimum delay difference to successfully resolve the multipath components and operate the RAKE receiver?

**Part-B ( $5 \times 10=50$  Marks)**  
**(All bits carry equal marks)**

11. a) What is small scale fading? Describe different types of small scale fading channels.  
 b) Given that transmitter radiates at a carrier frequency of 1750 MHz and when vehicle speed is 70 mph, calculate the receiver carrier frequency, if mobile is moving in perpendicular to the direction of arrival of transmitted signal.
12. a) Explain the principle of Space Time OFDM system.  
 b) Consider 3-branch selection combiner diversity system in which each branch receives an independent Rayleigh fading signal. If the average SNR is 30 dB, determine the probability that the SNR will drop below 10 dB. Compare the result of the system without any diversity.
13. a) What is handoff? Classify different types of handoff mechanisms and explain them.  
 b) Consider a channel with doppler spread of 80 Hz. Calculate the time separation required in samples of the received signal such that the samples are approximately independent.
14. a) Describe the significance of transport layer protocols.  
 b) Analyze packet error modeling on fading channel.
15. a) Describe about the routing techniques of wireless adhoc network.



- b) Compare the performance characteristics of different diversity combining techniques used in wireless communication systems.
16. a) Compare all propagation techniques.
- b) Explain SDMA multiple access technique.
17. Answer any **two** of the following:
- a) Cellular Telephony.
- b) In a location management network architecture, network signaling exchange is performed using the SS7 network. With reference to this, describe the role of each of the following entities:
- Service Switching Point (SSP)
  - Mobile Switching Center (MSC)
  - Visitor Location Register (VLR)
- c) A spectrum bandwidth of 25 MHz is allocated for a mobile cellular communication system and each. Voice channel requires a band width of 25 KHz. Estimate the system capacity for the following cases:
- A high power base station covering entire area.
  - Coverage area divided into 20 cells with cluster size 4.
  - Coverage area divided into 100 cells with cluster size 1. Also comment on the results obtained.

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Code No.: 7213 M

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.E. I Year (EEE) II-Semester (Make Up) Examinations, August-2016**  
**(Power Systems & Power Electronics)**

**Machine Modelling and Analysis**

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE from Part-B*

**Part-A (10 × 2=20 Marks)**

1. What do you mean by energy and co-energy in a magnetic field of an electromagnetic device?
2. Draw and explain the steady state operating characteristics of a shunt connected DC machine with constant voltage source.
3. Draw the cross section diagram of a dc machine with parallel armature winding and mention the parallel paths.
4. Mention about reference frame speeds, variable notations for the commonly used reference frames.
5. If A is in one reference frame and B another, show that  $({}^AK^B)^{-1} = {}^BK^A$ .
6. What is Parks transformation?
7. Draw the winding arrangement of two pole, three phase, Wye connected, symmetrical induction machine.
8. Show that the inertia constant H is equivalent to the stored energy of the rotor at synchronous speed normalized to the base power.
9. Draw the diagram of elementary two pole, two phase and salient pole synchronous machine.
10. Write the basic equation for mutual inductance between windings x and y.

**Part-B (5 × 10=50 Marks)**  
**(All bits carry equal marks)**

11. a) Demonstrate the computer simulation of a coupled circuit with the help of equations.  
b) Draw and express the two axis primitive model of a synchronous machine with damper windings.
12. a) Describe the mathematical model of DC series machine.  
b) Develop the Time domain block diagram of DC series machine.
13. a) Explain about three phase stationary circuit Resistor elements transformed to arbitrary reference frame with the help of equations.  
b) Explain about three phase stationary Inductor elements transformed to arbitrary reference frame with the help of equations.
14. a) Draw the equivalent circuit diagram of two pole, three phase and star connected symmetrical Induction machine in machine Variables using necessary variables.  
b) Obtain voltage equations of two pole, three phase and star connected symmetrical Induction machine in machine Variables in terms of flux linkages/sec.

Contd...2



15. a) Obtain the voltage equations of a three phase Synchronous machine with the reference frame fixed in rotor.  
b) Develop the equivalent circuit of a three phase Synchronous machine with the reference frame fixed in rotor with the help of equations.
16. a) Develop the equivalent circuit of magnetically coupled coil with coil 2 selected as reference and with the help of equations briefly.  
b) Draw time domain block diagram of DC Shunt motor along with state equations.
17. Write short notes on any **two** of the following:
- Variables observed from various reference frames.
  - Torque equation of Induction machine in machine variables.
  - Torque equation of synchronous machine in machine variables.

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Code No.: 9213 M

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.Tech. I Year (CSE) II-Semester (Make Up) Examinations, August-2016**

**Image Processing**

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE from Part-B*

**Part-A (10 X 2=20 Marks)**

1. Differentiate photopic and scotopic vision.
2. Find the number of bits required to store a 256 X 256 image with 32 gray levels.
3. Find DCT transform of a given 2 x 2 image  $\begin{bmatrix} 3 & 6 \\ 6 & 4 \end{bmatrix}$ .
4. What is the Walsh-Hadamard transform?
5. What is an 'edge' in an image? What are the mathematical operations used for edge detection?
6. What is the region splitting and merging operation in image segmentation?
7. Describe the Fidelity Criteria.
8. What is the role of encoder and decoder in a digital image data compression system?
9. Draw the block diagram of image restoration model.
10. List the different Noise Models.

**Part-B (5 × 10 = 50 Marks)**  
**(All bits carry equal marks)**

11. a) What are the fundamental steps involved in digital image processing? How an image is acquired?  
b) Explain the application of X-ray imaging in image processing.
12. a) The image  $f(m,n)$  is given below. What will be the value of  $F(0,0)$  and explain its importance.

$$\begin{bmatrix} 0 & 1 & 2 & 1 & 4 \\ 4 & 1 & 4 & 5 & 6 \\ 1 & 2 & 1 & 0 & 4 \\ 5 & 4 & 1 & 3 & 5 \\ 4 & 2 & 4 & 5 & 6 \end{bmatrix}$$

- b) Describe the image smoothing and sharpening operations in frequency domain.
13. a) State and explain various methods to find point, line and edges in the image.  
b) Write algorithm to compute basic global threshold value and dynamic thresholding value.
14. a) Explain the Huffman encoding with suitable example. Calculate the compression ratio.  
b) Derive forward and inverse transformations of KL-transform.
15. Describe constrained least square filtering for image restoration and derive its transfer function.
16. a) Describe the Sampling and Quantization techniques with neat diagram.  
b) What is the significance of 2D-DFT and what are the properties of 2D-DFT? Prove the linearity of 2D-DFT.
17. Write short notes on any *two* of the following:
  - a) Run length coding
  - b) Spatial averaging masks
  - c) Inverse Filtering.



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Code No. : 8211

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.E. I Year (Mech. Engg.) II-Semester (Main) Examinations, July-2016**  
(Advanced Design & Manufacturing)

**Design for Manufacture**

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE from Part-B*

**Part-A (10 × 2=20 Marks)**

1. Discuss on evolution of engineering materials.
2. How values of Tolerances are decided during design?
3. List the advantages of blanking in the development of metallic parts.
4. What are the applications of metal spun parts?
5. Explain the process of investment casting.
6. Differentiate the sand cast and die cast products.
7. How ceramic parts are produced?
8. Explain the process of injection moulding.
9. Explain surface finishing process in component manufacturing.
10. What do you mean by electronic scaling of a component in product design?

**Part-B (5 × 10=50 Marks)**

*(All bits carry equal marks)*

11. a) Discuss the suitability of cold finished steel parts for manufacturing.  
b) Explain different methods of machining rubber parts.
12. a) Explain explosive forming and electromagnetic forming methods with sketches.  
b) Explain design recommendations for rolled formed parts.
13. a) Differentiate the process of planing and shaping and their applications.  
b) Explain the process of die casting and their advantages over other casting methods.
14. a) Explain the design recommendations for manufacturing of ceramic parts.  
b) What are design considerations for automated assembly?
15. a) Explain the design of press fitted joints for plastics and rubber.  
b) Justify group technology with an example.
16. a) Explain the design recommendations of turned parts.  
b) Explain why DFM is not implemented in many countries.
17. Write short notes on any two of the following:
  - a) Centerless grinding of parts.
  - b) Design for Assembly of parts.
  - c) Low cost automation.

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Code No. : 8212

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.E. I Year (Mech. Engg.) II-Semester (Main) Examinations, July-2016**  
(Advanced Design & Manufacturing)

**Metal Casting and Welding Processes**

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE from Part-B*

**Part-A (10 × 2 = 20 Marks)**

1. What is inoculation? Why is the metal inoculated before pouring into the mould?
2. Classify plain carbon steels and mention their composition.
3. State a few heat treatable Aluminum alloys.
4. Discuss the composition and applications of invar.
5. Classify various zones of steel weldment with their temperatures.
6. What is the difference between annealing and normalizing? Why normalized components are harder than annealed ones.
7. What is retained austenite? How it is obtained during fast cooling of weld bead?
8. What are the defects those may occur due to the residual stresses in weldments?
9. Suggest various welding processes for Titanium alloys.
10. What are the sources of hydrogen in welding process? How does hydrogen induce a delayed crack in the weldment?

**Part-B (5 × 10 = 50 Marks)**  
*(All bits carry equal marks)*

11. a) State the process of producing malleable iron. Discuss its microstructure, properties and applications.  
b) What are various basic and acidic refractories used in melting furnaces? Compare the acidic and basic refractories based on composition and melting temperatures.
12. a) State various design aspects to be considered in designing gating system of Aluminum alloys.  
b) What is Bronze? Explain about various Bronzes with their composition and applications.
13. a) Two pairs of carbon steel specimens with predominantly pearlitic structure *i*) containing 0.6% carbon and another *ii*) with 0.95% carbon are welded with a fusion welding process. A considerable HAZ is observed due to formation of martensite. To reduce the hardness it is decided to carry out annealing process. State the annealing process for the above weldments and also explain where and why the annealing cycles for above two metals differ.  
b) What is the heat treatment process recommended to improve the strength of non-ferrous alloys whose solubility changes the phases widely with temperature? Explain the process in detail.
14. a) Draw the Schaeffler diagram and explain its importance.  
b) Discuss about knife edge attack. How do you prevent it?



15. a) What are the difficulties in the welding of Ferritic and austenitic stainless steels?  
b) Justify the statement "Aluminium alloys are difficult to weld".
16. a) Describe the various defects that occur in castings due to gas entrapment and absorption. State the remedies.  
b) Describe the composition of Zinc based die casting alloys and their applications.
17. Write short notes on any *two* of the following:
  - a) Austempering
  - b) Welding stresses.
  - c) Liquation cracks in weldments.

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Code No.: 6212 M

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.E. I Year (ECE) II-Semester (Make Up) Examinations, August-2016**  
**(Embedded Systems & VLSI Design)**

**Embedded Real Time Operating Systems**

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE from Part-B*

**Part-A (10 X 2=20 Marks)**

1. Draw a typical architecture of Operating System.
2. Define a job, process and task in the context of Operating system.
3. Write in brief about the importance of scheduling algorithm used in RTOS.
4. List out advantages of RMS over EDF.
5. What is the use of PCB?
6. Compare Linux 2.4 and Linux 2.6.
7. Differentiate between Kernel mode and user mode of OS operation.
8. What are Tasklets and where do we use them?
9. Distinguish Linux and RT Linux.
10. List the intertask communication methods in VxWorks.

**Part-B (5 × 10 = 50 Marks)**

11. a) What is OS and write the importance of OS in Embedded Real-time systems? [4]  
b) Define scheduling. And why is it required in Operating systems? Briefly write about different scheduling algorithms used in ERTOS. [6]
12. a) How does a message queue function works as a method for intertask communication? Explain with an example. [5]  
b) Explain the principle of operation of the EDF algorithm with an example. [5]
13. a) How secured is Linux and what makes it secured when compared to other operating systems? [4]  
b) What is interrupt context and how it is implemented in Linux? [6]
14. a) Discuss the use of Major number and minor number in device drivers. [4]  
b) Classify the device drivers, give one example and write in short about each one of them. [6]
15. a) Discuss about Debugging techniques used to monitor kernel code and to trace errors. [6]  
b) Compare and contrast between the scheduling algorithms of VxWorks,  $\mu$ cos and RTLinux. [4]
16. a) A real-time system consists of three tasks T1, T2, and T3. Their characteristics have been shown in the following table. [5]

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Task	Phase (ms)	Execution Time (ms)	Relative Deadline (ms)	Period (ms)
T <sub>1</sub>	20	10	20	20
T <sub>2</sub>	40	10	50	50
T <sub>3</sub>	70	20	80	80

Suppose the tasks are to be scheduled using a table-driven scheduler. Compute the length of time for which the schedules have to be stored in the pre-computed schedule table of the scheduler.

- b) A cyclic scheduler is to be used to run the following set of periodic tasks on a uniprocessor: T<sub>1</sub> : (e<sub>1</sub>=1, p<sub>1</sub>=4), T<sub>2</sub> : (e<sub>2</sub>=2, p<sub>2</sub>=5), T<sub>3</sub> : (e<sub>3</sub>=1, p<sub>3</sub>=20), T<sub>4</sub> : (e<sub>4</sub>=2, p<sub>4</sub>=20). Select an appropriate frame size. [5]

17. Write short notes on any *two* of the following:

- a) Functions of an RTOS [5]
- b) mknod and sudo [5]
- c) Features of  $\mu\text{cos}$  [5]



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Code No.: 7212 M

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.E. I Year (EEE) II-Semester (Make Up) Examinations, August-2016**  
**(Power Systems & Power Electronics)**

**Power Electronics Controlled Electric Drives**

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE from Part-B*

**Part-A (10 X 2=20 Marks)**

1. Discuss discontinuous conduction in converters.
2. Briefly explain the principle of forced commutation.
3. Explain the concept of Regenerative Braking in Dc drives in brief.
4. Write the importance of dual converters.
5. What are the essential differences between static kramer drive and static scherbius drive?
6. Write the advantages of CSI fed induction motor drive over VSI fed induction motor drive.
7. Draw the block diagram of microprocessor based synchronous motor drive.
8. List the advantages of microprocessor based control of drives.
9. Draw the speed – torque characteristics of switched reluctance motor drive.
10. Write the features of brushless dc motor.

**Part-B (5 × 10=50 Marks)**

11. a) Why voltage control is required in inverter circuits? Explain the various methods of voltage control in inverter circuits. [6]  
b) List the advantages and disadvantages of ac voltage converters. [4]
12. a) Explain the state space model of a dc motor. [5]  
b) A dc separately motor takes a current of 80 A on a 480 V supply and runs at 960 rpm. The armature resistance is 0.25 Ω. A chopper is used to control the speed of the motor at constant torque. The on-period of the chopper is 3ms. Determine the duty ratio of the chopper at 750 rpm. [5]
13. a) State and discuss the various methods of speed control of induction motor. [5]  
b) A 440V, 3-phase, 50Hz, 6 pole, 945 rpm, delta connected IM has the following parameters referred to the stator.  $R_s=2.0 \Omega$ ,  $R_r^1=2.0 \Omega$ ,  $X_s=3 \Omega$ ,  $X_r^1=4 \Omega$ . When driving a load whose torque varies linearly with speed, at rated voltage, it runs at rated speed. The motor speed is controlled by the stator voltage. Determine motor terminal voltage, current and torque at 800 rpm. [5]
14. a) With the help of block diagram, explain the speed control of induction motor using microprocessors. [5]  
b) Explain the operation of 4-phase, 4/2 pole variable reluctance stepper motor. [5]
15. a) Explain with a neat block diagram the operation of a high performance brushless dc motor drive. [5]  
b) Discuss the speed control schemes of switched reluctance motor drive. [5]
16. a) Compare one quadrant and two quadrant converters. [5]  
b) Discuss the digital simulation process of dc motors. [5]
17. Write short notes on any two of the following:  
a) Static slip energy recovery schemes employing in the rotor circuit of induction motor. [5]  
b) Speed control of dc motor using microprocessor. [5]  
c) Speed – Torque characteristics of BLDC motor. [5]

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Code No.: 5212 M

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.E. I Year (ECE) II-Semester (Make Up) Examinations, August-2016**  
**(Communication Engineering & Signal Processing)**

**Wireless Communications and Networking**

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE from Part-B*

**Part-A (10 X 2=20 Marks)**

1. Give the mathematical model of Jakes channel.
2. Draw the block diagram of RAKE demodulator.
3. Give the merits of FDMA over TDMA.
4. Distinguish between fixed channel assignment and dynamic channel assignment.
5. If a base station covers 1 Km radius in a plain open area modelled as a 2-ray channel, what would be the coverage if it was used with free space communications?
6. What is Mobile IP?
7. A hexagonal cellular system has a cluster size of 4 cells as the basic model for frequency reuse implementation. Calculate reuse distance, if the radius of the hexagonal cell is 5 Km.
8. Discuss mobility management.
9. Compare piconet and scatternet in Bluetooth.
10. Calculate the time separation required for two signals to achieve a high degree of time diversity in a classical Rayleigh channel at 900 MHz with a mobile speed of 10 Km/ hour.

**Part-B (5 × 10=50 Marks)**

*(All bits carry equal marks)*

11. a) What is small scale fading? Classify and describe different types of small scale fading channels.  
b) Given that transmitter radiates carrier frequency of 1550 MHz and vehicle speed is 50 mph, calculate the receiver carrier frequency, if mobile is moving towards and away from transmitter.
12. a) Find out and analyse the space time OFDM and space diversity techniques.  
b) Compare diversity techniques and channel coding techniques.
13. a) What is handover? Classify handover mechanisms and explain them.  
b) Compare the interface specifications of CDMA and GSM.
14. a) Describe the significance of transport layer protocols.  
b) Analyse packet error modeling on fading channel.
15. a) Describe about the routing techniques of wireless adhoc network.  
b) Compare IS 95 and GPRS wireless data networks.

- 16. a) Derive the expression for received signal power for 2-ray ground reflected propagation model with the help of neat diagram.
- b) Compare Erlang capacity of FDMA and TDMA access techniques.

17. Answer any **two** of the following:

- a) Coherence bandwidth and coherence time.
- b) A cellular system uses a frequency reuse factor of  $1/4$ . If the path loss exponent is 4 and cell radius is 5 km, estimate the following:
  - i) SIR of the system with no cell sectoring.
  - ii) SIR of the system with  $60^\circ$  cell sectoring.
  - iii) SIR of the system with  $120^\circ$  cell sectoring.
- c) Describe the concept of frequency reuse factor with an example.

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Code No.: 8121 M

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.E. I Year (Mech.) I-Semester (Make Up) Examinations, March-2016**  
**(Advanced Design & Manufacturing)**

**Mathematical Methods for Engineers**

Time: 3 hours

Max. Marks: 70

Note: Answer ALL questions in Part-A and any FIVE questions from Part-B

**Part-A (10 X 2=20 Marks)**

1. Prove that  $\vec{a} \times \vec{b} = \vec{b} \times \vec{c} = \vec{c} \times \vec{a}$ , when  $\vec{a} + \vec{b} + \vec{c} = \vec{0}$ .
2. Define Solenoidal of vector function.
3. Define symmetric and skew symmetric tensors.
4. Write the christoffel symbols of second kind.
5. Discuss the consistency of the equations  $x + 2y = 1$ ,  $7x + 14y = 12$ .
6. Find the eigen vectors of the matrix  $\begin{bmatrix} 1 & -2 \\ -5 & 4 \end{bmatrix}$
7. Show that  $L\{F''(t)\} = s^2 F(s) - sF'(0) - F''(0)$ , where  $s$  is real number.
8. Write down the Sturm-Liouville problem.
9. Classify whether the wave equation is Parabolic?
10. Write the solution of two dimensional heat equation by variable separable method.

**Part-B (5 X 10=50 Marks)**  
**(All bits carry equal marks)**

11. a) Prove that  $\vec{a} \times (\vec{b} \times \vec{c}) + \vec{b} \times (\vec{c} \times \vec{a}) + \vec{c} \times (\vec{a} \times \vec{b}) = \vec{0}$   
b) Show that  $\text{Div.}(\text{Curl } \vec{v}) = \vec{0}$
12. a) Show that any inner product of tensors  $A_r^p$  and  $B_t^{qs}$  is a tensor of rank 3.  
b) Define metric tensors and Conjugate tensors and determine the metric tensor in cylindrical coordinate system.
13. a) Solve the system of equations  
 $2x_1 - x_2 + 0 \cdot x_3 = 7$   
 $-x_1 + 2x_2 - x_3 = 1$   
 $0 \cdot x_1 - x_2 + 2x_3 = 1$   
Using Gauss - Seidal method

- b) Find the eigen values and eigen vectors of the matrix  $\begin{bmatrix} -2 & 2 & -3 \\ 2 & 1 & -6 \\ -1 & -2 & 0 \end{bmatrix}$

14. a) Solve the equation

$$\frac{d^3y}{dx^3} + 2\frac{d^2y}{dx^2} - \frac{dy}{dx} - 2y = 0 \text{ where } y = 1, \frac{dy}{dx} = 2 ;$$

$$\frac{d^2y}{dx^2} = 2 \text{ at } t = 0 \text{ Using Laplace transforms.}$$

b) State and Prove final value theorem.

15. a) A tightly stretched string of length  $\ell$  with fixed ends is initially in equilibrium position. It is set vibrating by giving each point a velocity  $v_0 \sin \frac{3\pi x}{\ell}$ . Find the displacement  $y(x, t)$ .

b) Explain the transformation of two dimensional Laplace's equation in spherical coordinate system and write the equation in spherical coordinate system.

16. a) Find the solution of following system of equations using Cramer's rule

$$x + y + z = 4, \quad x - y + z = 0, \quad 2x + y + z = 5.$$

b) Prove that  $\text{Curl Grad } f = \nabla \times \nabla f = \bar{0}$

17. a) Find the eigen function and eigen value for the Sturm-Liouville problem  $y'' + \lambda y = 0$ ,  $y(0) = 0$ ,  $y'(\ell) = 0$ .

b) Express the value of  $\begin{Bmatrix} 1 \\ 22 \end{Bmatrix}, \begin{Bmatrix} 2 \\ 21 \end{Bmatrix}, \begin{Bmatrix} 2 \\ 33 \end{Bmatrix}, \begin{Bmatrix} 3 \\ 32 \end{Bmatrix}$  in rectangular co-ordinate system.

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**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.E. I Year (Mech.) I-Semester (Make Up) Examinations, March-2016**  
**(Advanced Design & Manufacturing)**

**Finite Element Techniques**

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE questions from Part-B*

**Part-A (10 X 2=20 Marks)**

1. State stress equilibrium equations and apply it for 1D structural problem.
2. Write the shape functions for a bar element.
3. Explain the significances of Hermit shape functions applied to a beam element.
4. List few applications related to frame elements.
5. Examine the difference between three noded triangular element and six noded triangular element.
6. Give few examples geometric isotropy.
7. Explain about torsional rigidity in the context of F.E.M applied to a circular shaft.
8. Develop FEM formulation for a dynamic system described by  $[M] y''(t) + [K] y(t) = 0$ .
9. Distinguish between Membrane plate element and Bending plate element.
10. Write about material non linearity.

**Part-B (5 X 10=50 Marks)**

*(All bits carry equal marks)*

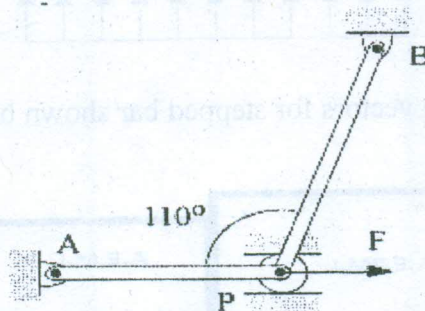
11. The displacement field in a material is given by

$$u_x = A(3x - y), \quad u_y = Axy^2$$

where A is a small constant.

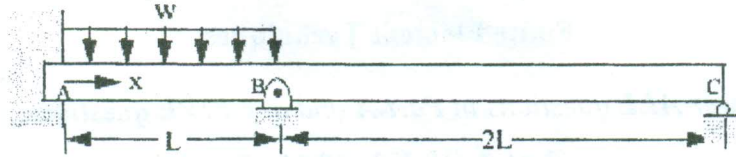
Evaluate the strains. What is the rotation? Sketch the deformation and any rigid body motions of a differential element at the point (1,1).

12. A force  $F = 20$  kN is applied to the roller that slides inside a slot as shown in Fig. given here under Both bars have an area of cross-section of  $A = 100 \text{ mm}^2$  and a Modulus of Elasticity  $E = 200$  GPa. Bar AP and BP have lengths of  $AP = 200$  mm and  $BP = 250$  mm respectively. Determine the displacement of the roller and the reaction force on the roller using linear elements to represent each bar.

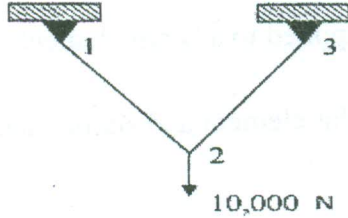


Contd..2..

13. Using a single beam element for AB and a single beam element for BC in Fig. given here under, determine (a) the slope at B and C (b) reaction force and moment at A.



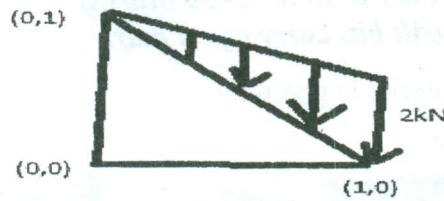
14. A truss structure and its node table shown below: Element area =  $1 \text{ cm}^2$ , Material = steel (200GPa)



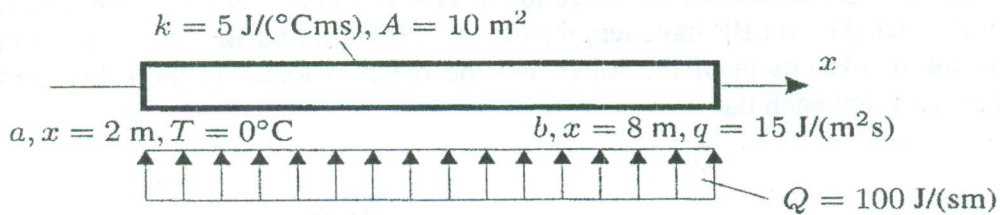
Node	X	Y
1	0	40
2	30	0
3	60	40

- A. Find the joint displacements at 2. Find the stress in the elements.

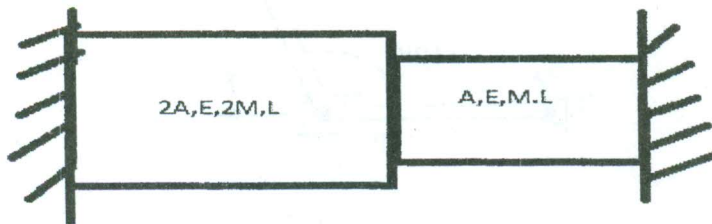
15. CST element shown below has no body force and a surface traction applied to one of the edges. Find load vector for the element.



16. A 1D conduction element is shown below with end points a(x=2) and b(x=8). The end a is maintained at temperature  $0^\circ\text{C}$  and end b allowed heat flow  $15 \text{ W/m}^2$ . Element is given a heat supply Q. Idealize it into two elements and determine nodal temperatures in x-direction.



17. Extract eigen values and eigen vectors for stepped bar shown below:



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Code No.: 8126 M

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.E. I Year (Mech.) I-Semester (Make Up) Examinations, March-2016**  
**(Advanced Design & Manufacturing)**

**Product Design and Process Planning**

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE questions from Part-B*

**Part-A (10 X 2=20 Marks)**

1. Define product design and process planning functions.
2. List the various sources of Ideas.
3. Formulate the selling price of a product.
4. Describe the concept of Break Even Point with a neat sketch.
5. List the basic design rules for casting.
6. Describe about the importance of properties of engineering materials while designing product.
7. Define Anthropometry.
8. Discuss the concept of Just In Time.
9. Define Computer Aided Design and Computer Aided Manufacturing.
10. Explain various salient features of Group Technology.

**Part-B (5 X 10=50 Marks)**

*(All bits carry equal marks)*

11. a) Discuss about the various phases of morphology of design.  
b) Define value of appearance and explain various laws of appearance.
12. a) Categorize the significant aspects of patents and copy rights.  
b) Define value analysis and explain the procedure.
13. a) Discuss the criteria in the selection of plastics.  
b) Explain basic product design rules to be considered in forging.
14. a) Define Ergonomics and mention Man – Machine Information considerations  
b) Explain the concept of process sheet and narrate its importance.
15. a) Briefly explain the role of computers in product design and manufacturing?  
b) Discuss the integration of product design, manufacturing and production control.
16. a) Derive the equation for Breakeven point.  
b) Describe the material and process selection parameters.
17. a) Writ short notes on any three of the following
  - a) Selection of right product.
  - b) Failure analysis of a new product.
  - c) Computer Aided Process Planning.
  - d) Production Flow Analysis.
  - e) Benefits of Group Technology.

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Code No.: 5126 M

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.E. I Year (ECE) I-Semester (Make Up) Examinations, March-2016**  
**(Communication Engineering & Signal Processing)**

**Image and Video Processing**

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE questions from Part-B*

**Part-A (10 X 2=20 Marks)**

1. Explain the basic relationship between the pixels in a Digital Image.
2. Define 2-D Fourier transform pair.
3. Explain the contrast stretching operation of an image.
4. Mention three to four applications of edge detection.
5. Define image redundancy and list the types of redundancies.
6. List the various JPEG standards.
7. Write about the important features of digital video.
8. Classify the three dimensional motion models.
9. Explain pixel based motion estimation, in brief.
10. What is meant by mesh based motion estimation?

**Part-B (5 X 10=50 Marks)**

*(All bits carry equal marks)*

11. a) Explain Sampling and Quantization of an Image with suitable diagrams.  
b) Show that, the 2D-DCT of an image can be computed by row and column passes with a 1D DCT Algorithm.
12. a) Describe the image sharpening methods in Frequency domain.  
b) Discuss about different edge detection methods, in detail.
13. a) What is error free compression? Explain about run length coding using an example.  
b) Generate Huffman code for the symbols shown in the following table, also calculate entropy:

Symbol	A1	A2	A3	A4	A5	A6
probability	0.1	0.4	0.06	0.1	0.04	0.3

14. a) Discuss about the Geometric image formation model.  
b) Differentiate between analog and digital video processing.
15. a) Explain about the block based transform coding, in detail.  
b) Discuss the applications of motion estimation in video coding.
16. a) Describe the various applications of image processing.  
b) Explain about region based segmentation.
17. Write short notes on any **two** of the following:
  - a) Lossy and lossless Image Compression techniques.
  - b) Photometric image formation.
  - c) Multi resolution photo estimation.

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Code No.: 7126 M

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.E. I Year (EEE) I-Semester (Make Up) Examinations, March-2016**  
**(Power Systems & Power Electronics)**

**Power Quality Engineering**

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE questions from Part-B*

**Part-A (10 X 2=20 Marks)**

1. Write the equation for calculation of voltage sag in a non-radial system.
2. Mention some PQ measuring instruments.
3. Define Harmonics and voltage flicker.
4. Draw magnitude – duration plot for faults originating in transmission and distribution systems.
5. Identify the causes of transients.
6. Define THD.
7. Specify the importance of grounding.
8. Mention the causes for phase angle Jumps.
9. List the harmonic sources from the industrial loads.
10. Define an intelligent system with respect to power quality data assessment.

**Part – B (5 X 10=50 Marks)**

11. Explain the importance of power quality study? According to IEEE standards, classify various power quality problems.
12. Explain the various methods of calculation of voltage sag.
13. Explain the effect of voltage sag on adjustable speed drive of a DC motor.
14. Define inter harmonics. Explain some mitigation methods of controlling harmonic distortion.
15. Identify the different grounding techniques and explain them in detail.
16. Explain the process involved in assessment of PQ data.
17. Discuss about fast assessment methods of voltage in distribution system.

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Code No.: 9126 M

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.Tech. I Year (CSE) I-Semester (Make Up) Examinations, March-2016**

**Information Storage Management**

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE questions from Part-B*

**Part-A (10 X 2=20 Marks)**

1. Describe the role of Virtualization in Cloud Computing.
2. The average I/O size of an application is 64 KB. The following specifications are available from the disk manufacturer: average seek time = 5 ms, 7,200 RPM, and transfer rate = 40 MB/s. Determine the maximum IOPS that could be performed with this disk for the application. Using this case as an example, explain the relationship between disk utilization and IOPS.
3. Draw the schematic for illustrating FCIP topology.
4. Compare between the General-Purpose Servers and NAS Devices.
5. Specify the levels of taking a Backup in a storage environment.
6. Define the various modes of remote Replication.
7. Summarize the benefits of Cloud Computing.
8. Write in your words justifying that "Cloud computing bring in business agility."
9. Outline the three categories that constitute the Risk Triad.
10. What are Storage Infrastructure Management Challenges?

**Part-B (5 X 10=50 Marks)**

11. a) Describe the process of WRITE operation on a RAID 5. [4]  
b) Explain in detail the components and working of an Intelligent Storage System. [6]
12. a) List and explain the various ports used in a switched fabric. [5]  
b) Define zoning and explain the types of zoning employed in a Fabric. [5]
13. a) Define Data Deduplication and explain its implementation. [5]  
b) Explain the process of taking Backup in a SAN Environment. [5]
14. a) Explain various service models in a Cloud environment. [5]  
b) Evaluate the various cloud adoption considerations an organization need to justify, before migrating to a cloud environment. [5]
15. a) Discuss the various Storage Security Domains. [5]  
b) Explain few examples of monitoring within a storage infrastructure. [5]
16. a) Explain Virtual Storage Provisioning. [5]  
b) Explain in detail Components of an FCoE Network. [5]
17. Write short notes on any **two** of the following:
  - a) Retrieval of Objects in Object Based Storage Devices [5]
  - b) Cloud Computing Infrastructure. [5]
  - c) Information Life Cycle Management. [5]

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Hall Ticket Number:

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Code No.: 8125 M

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.E. I Year (Mech.) I-Semester (Make Up) Examinations, March-2016**  
**(Advanced Design & Manufacturing)**

**Flexible Manufacturing Systems**

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE questions from Part-B*

**Part-A (10 X 2=20 Marks)**

1. Differentiate between cellular and flexible manufacturing.
2. Discuss the role of supervisor in manufacturing system.
3. Define just-in-time manufacturing.
4. Describe the part classification codes of group technology.
5. Discuss the features of machining centers.
6. What is the role of work holding equipment in the design of flexible manufacturing systems?
7. Explain the application of AGVs in automated storage and retrieval system.
8. List out various auxiliary equipment used in automated storage and retrieval.
9. Explain the importance of chip disposal in automated movement.
10. Give the general functions of communication networks of flexible manufacturing systems.

**Part-B (5 X 10=50 Marks)**  
**(All bits carry equal marks)**

11. a) Explain the concept of manufacturing cell. State the reasons for adoption of single station automated cell.  
b) State the applications of single station automated cell. How do you arrive at the number of workstations required in manufacturing cell?
12. a) Draw Group Technology layout and compare with process layout. State the benefits of GT system.  
b) How the inventory of raw materials and purchased parts be reduced in Just-in-time production?
13. a) How the computers are implemented to plan, monitor, control and manage in FMS?  
b) Discuss the different types of data associated with FMS.
14. a) Classify various methods of transporting work pieces on flow lines.  
b) Explain the guidelines used in planning of material handling in FMS.
15. a) What are the various material handling equipments used in practice and mention their relative advantages?  
b) What are the various applications of "Automated guided vehicle systems"? Explain the methods of vehicle guidance and routing.
16. In a manufacturing organization, the process planning department has identified machines for machining the different parts in the following manner.
  - a) Machine 1 is used for machining parts A and E
  - b) Machine 2 is used for machining parts D and F
  - c) Machine 3 is used for machining parts A and B
  - d) Machine 4 is used for machining parts C and D
  - e) Machine 5 is used for machining parts B and E
  - f) Machine 6 is used for machining parts C, D and FBy using the rank order clustering technique, identify the logical part families and machine groups in each cell.
17. a) Explain the use of programmable logic controllers in flexible manufacturing systems.  
b) What is tool monitoring? Explain how it is useful for fault detection.

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Hall Ticket Number:

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Code No.: 5121 M

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.E. I Year (ECE) I-Semester (Make Up) Examinations, March-2016**  
**(Communication Engineering & Signal Processing)**

**Signal Compression Theory and Methods**

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE questions from Part-B*

**Part-A (10 X 2=20 Marks)**

1. Define entropy.
2. State source coding theorem.
3. Distinguish between scalar quantization and vector quantization.
4. Define wavelet.
5. Explain the need for sub-band coding in signal compression.
6. Write any two properties of discrete sine transform.
7. Distinguish between analysis filter and synthesis filter.
8. List the properties of scaling function.
9. Mention the need for Video compression.
10. List the applications of transform coding in audio compression.

**Part – B (5 X 10=50 Marks)**

*(All bits carry equal marks)*

11. a) Explain run length coding with an example.  
b) State and prove kraft inequality.
12. a) Describe and calculate the rate distortion for Binary source.  
b) Choose any one differential encoding scheme and explain in detail.
13. a) With a neat sketch, Explain the two-stage sub-band coding.  
b) Explain the properties of discrete cosine transform.
14. a) Describe about the speech compression in detail.  
b) In detail explain about the KarhunenLoeve transform.
15. a) Compare the audio compression standards.  
b) Summarize the H.263 – video compression standard in detail.
16. a) State Walsh transform and give its properties.  
b) Explain the principle of compression using wavelet transform.
17. Write a short notes on the following
  - i. Arithmetic coding.
  - ii. Uniform and non-uniform quantization.

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Code No.: 9124 M

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.Tech. I Year (CSE) I-Semester (Make Up) Examinations, March-2016**

**Object Oriented Software Engineering**

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE questions from Part-B*

**Part-A (10 X 2=20 Marks)**

1. "Software doesn't wear out" justify.
2. Define an Information system.
3. Requirement analysis is an important activity in OOSE? Justify your answer.
4. Discuss purpose of existing system analysis.
5. Differentiate Generalization from Specialization by proper example.
6. Discuss different relationships exists in class diagram and briefly mention their purpose.
7. Why verification is important in software testing?
8. Differentiate block box and white box testing.
9. Draw the activity diagram for the activities involved in writing a text book.
10. Differentiate coupling and cohesion.

**Part-B (5 X 10=50 Marks)**

11. a) Discuss various reasons for quality problems. (5)  
b) Discuss different phases in Water fall model. (5)
12. Discuss different fact finding techniques to capture requirements. (10)
13. a) Discuss different algorithmic approaches for operation specification. (5)  
b) Explain life cycle approach to construct state diagram with an example. (5)
14. Discuss objectives and constraints of good design. (10)
15. What is the importance of UML diagrams in Object Oriented Software Engineering?  
Explain their significance with appropriate example. (10)
16. a) Explain different CASE tools used in software system development. (6)  
b) Discuss different levels of testing. (4)
17. Write short note on  
a) Collaboration diagram (4)  
b) Regression testing (3)  
c) Advantage of Design Patterns in OO design (3)

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**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.Tech. I Year (CSE) I-Semester (Make Up) Examinations, March-2016**

**Artificial Intelligence**

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE questions from Part-B*

**Part-A (10 X 2=20 Marks)**

1. What is AI? State its applications.
2. Compare depth first search and breadth first search.
3. Define modus ponens inference rule. Give its significance.
4. Show that given formula is unsatisfiable by giving tableau proof  $(A \wedge B) \wedge (B \rightarrow \neg A)$ .
5. List the characteristics of expert systems.
6. Define joint probability and conditional probability with example.
7. What is unsupervised learning? How it differs from supervised learning?
8. Why activation function is required in neural network? Describe sigmoid function.
9. List the different types of fuzzy membership functions.
10. What is semantic analysis?

**Part - B (5 X 10=50 Marks)**

11. a) Draw the state space graph for the 8-puzzle problem for the initial state (6)

3	7	6
5	1	2
4	-	8

5	3	6
7		2
4	1	8

Goal state

- b) Explain the A\* algorithm with example. (4)
12. a) Use Resolution refutation to prove that Gray elephant always like the pink elephant using the following information (7)
- i. Sam, Clyde and Oscar are Elephants.
  - ii. Sam is pink.
  - iii. Clyde is Gray and likes Oscar.
  - iv. Oscar is either Pink or gray (but not both) and likes Sam.
- b) Describe knowledge representation using frames. (3)
13. a) What is an expert system? Describe the major components of an expert system. (5)
- b) Given that probability of the statement 'John has a viral' is 0.20. Probability of John being observed sneezing when he had viral is 0.8 and probability of John being observed sneezing when he did not have viral is 0.2. Find the probabilities of the following statements.
- i. John having viral if he is seen sneezing
  - ii. John having viral if he is not sneezing (5)
14. a) What is inductive learning? Explain how it is used in decision trees with an example? (5)
- b) Explain the Perceptron learning algorithm. (5)
15. a) Write the Grammar and draw a parse tree for the sentence "The boy goes to the market". (8)
- b) Write the location case for the following sentence "The book is lying on the large table". (2)
16. a) What is alpha-beta pruning? Show how it improves the performance of the minmax procedure with an example. (5)
- b) Explain the conversion of a formula in propositional logic to its CNF with an example. (5)
17. Write short notes on
- i. Importance of Bayesian networks (3)
  - ii. Backpropagation learning (3)
  - iii. Difference between simple and recursive transition networks. (4)



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**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.Tech. I Year (CSE) I-Semester (Make Up) Examinations, March-2016**

**Artificial Intelligence**

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE questions from Part-B*

**Part-A (10 X 2=20 Marks)**

1. What is AI? State its applications.
2. Compare depth first search and breadth first search.
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6. Define joint probability and conditional probability with example.
7. What is unsupervised learning? How it differs from supervised learning?
8. Why activation function is required in neural network? Describe sigmoid function.
9. List the different types of fuzzy membership functions.
10. What is semantic analysis?

**Part - B (5 X 10=50 Marks)**

11. a) Draw the state space graph for the 8-puzzle problem for the initial state (6)

3	7	6
5	1	2
4	-	8

5	3	6
7		2
4	1	8

Goal state

- b) Explain the A\* algorithm with example. (4)
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- b) Explain the Perceptron learning algorithm. (5)
15. a) Write the Grammar and draw a parse tree for the sentence "The boy goes to the market". (8)
- b) Write the location case for the following sentence "The book is lying on the large table". (2)
16. a) What is alpha-beta pruning? Show how it improves the performance of the minmax procedure with an example. (5)
- b) Explain the conversion of a formula in propositional logic to its CNF with an example. (5)
17. Write short notes on
- i. Importance of Bayesian networks (3)
  - ii. Backpropagation learning (3)
  - iii. Difference between simple and recursive transition networks. (4)



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**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.E. I Year (E.C.E.) I-Semester (Make Up) Examinations, March-2016**  
**(Communication Engineering & Signal Processing)**

**Multirate Signal Processing**

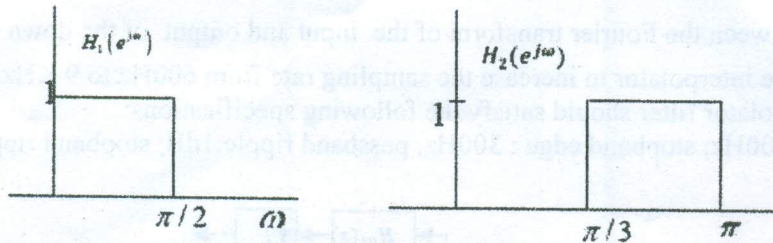
Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE questions from Part-B*

**Part-A (10 X 2=20 Marks)**

- Define linearity and time-invariance of a discrete time system.
- The Fourier transforms of the impulse responses,  $h_1(n)$  and  $h_2(n)$  of two LTI systems are as shown in figure below



Find the Fourier transform of the impulse response of the overall system, when they are connected in parallel.

- Determine the number of additions, multiplications and memory locations required for direct form II realization of an IIR digital filter transfer function having numerator polynomial of order M and denominator polynomial of order N.
- Write the conditions on the impulse response  $h(n)$  of an FIR filter to have linear phase.
- A speech signal  $x(t)$  is digitized at a sampling rate of 16 KHz. The speech signal was destroyed once the sequence  $x(n)$  was stored on a magnetic tape. Later it was required to obtain the speech signal sampled at the standard 8 KHz used in telephony. Draw the schematic diagram to do this using discrete time processing.
- Determine the polyphase transfer functions  $E_0(z)$ , and  $E_1(z)$  for two-branch polyphase realization of a length-6 FIR filter.
- Check for perfect reconstruction of two-channel filter bank for the following analysis and synthesis filters:  $H_0(z) = 2 - z^{-1}$ ,  $H_1(z) = 2 + 3z^{-1}$ ,  $G_0(z) = -1 + 1.5z^{-1}$ ,  $G_1(z) = 1 + 0.5z^{-1}$ .
- Obtain the perfect reconstruction condition for linear Phase FIR PR QMF Banks.
- Obtain Haar wavelet and plot it for wavelet coefficients  $h_1(0) = \frac{1}{\sqrt{2}}$  and  $h_1(1) = -\frac{1}{\sqrt{2}}$
- Write the dilation equations using scaling coefficients and wavelet coefficients.

**Part-B (5 X 10=50 Marks)**

- a) An initially relaxed LTI system was tested with an input signal  $x(n) = 2u(n)$ , and found to have a response as shown in the following table [4]

n	1	2	3	4	5	.....	100	.....
y(n)	2	4	8	12	20	.....	20	.....

- Obtain the impulse response of the system
  - Deduce the difference equation of the system
- b) Consider the system shown in Figure 1, where  $H(e^{j\omega})$  is an ideal LTI low pass filter with [6]
- cutoff of  $\pi/8$  rad/sec and the spectrum of  $x_a(t)$  is shown in Figure 2.
- What is the maximum value of T to avoid aliasing in the ADC?
  - If  $1/T=10$  kHz, then what will be the spectrum of  $y_r(t)$ .

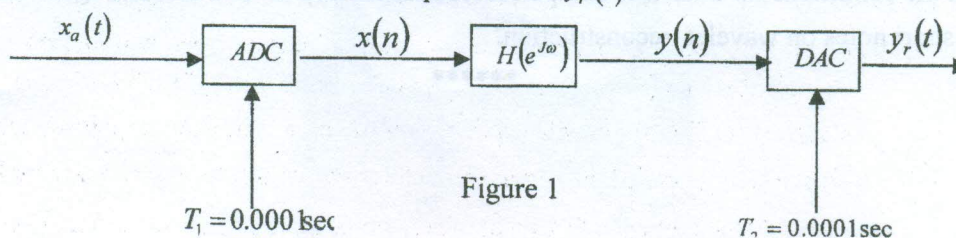
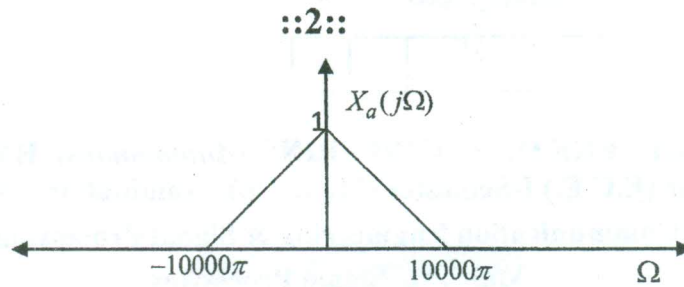


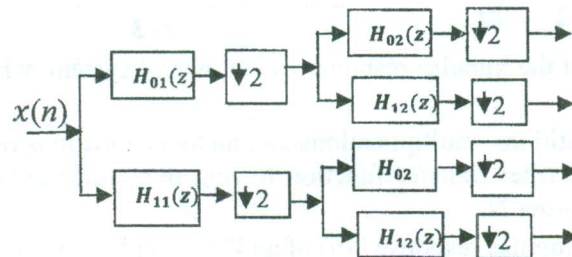
Figure 1

Contd...2





12. a) Explain the bilinear transformation method. [3]  
 b) Design a Chebyshev IIR digital low pass filter for the following Specifications: [7]  
 Pass band cutoff frequency: 400Hz; Stop band cutoff frequency: 600Hz  
 Pass band ripple: 1dB; Stop band ripple: 10dB  
 Assuming sampling frequency of 2000Hz. Use Bilinear transformation.
13. a) Obtain relation between the Fourier transform of the input and output of the down sampler. [4]  
 b) Design a two stage interpolator to increase the sampling rate from 600Hz to 9 KHz. [6]  
 The overall interpolator filter should satisfy the following specifications:  
 passband edge : 200Hz; stopband edge : 300Hz, passband ripple: 1dB; stopband ripple: 60dB.
- 14.



- a) Obtain non-tree equivalent for the above tree structured QMF bank and relations between the analysis filters of the two structures. [4]  
 b) The analysis filters of a three channel QMF filter bank are [6]  
 $H_0(z) = 1, H_1(z) = 2 + z^{-1} + z^{-5}, H_2(z) = 3 + z^{-1} + 2z^{-2}$   
 i) Can you determine the FIR synthesis filters  $G_0(z)$  and  $G_1(z)$  so that the two channel QMF bank is an alias-free and perfect reconstruction system. If so find them.  
 ii) If not, find the set of stable IIR filters for an alias-free and perfect reconstruction system.
15. a) Obtain Daubechies wavelet filter coefficients for  $N=2$  using coefficient domain solution. [7]  
 b) Consider a two channel perfect reconstruction biorthogonal filter bank with the analysis filters  $h_0(n) = \{-1, 2, 6, 2, -1\}/4\sqrt{2}$  and  $h_1(n) = \{1, 2, 1\}/2\sqrt{2}$ . Find the corresponding dual (synthesis) filters  $\tilde{h}_0(n)$  and  $\tilde{h}_1(n)$ . [3]
16. a) Show that the frequency spectrum  $X(e^{j\omega})$  of a discrete time signal  $x(n)$  is periodic with respect to  $\omega$  with a period of  $2\pi$ . [7]  
 b) Design a optimal FIR highpass filter of length 3 to meet the following specifications: [3]  
 Passband edge frequency =  $f_p = 1000$  Hz;  
 Stopband edge frequency =  $f_s = 750$  Hz  
 Sampling frequency = 5000 Hz  
 Tolerance ratio =  $(\delta_p/\delta_s) = 2$
17. Write short notes on any **two** of the following:
- a) Bring out the advantages of Multirate Signal Processing. [5]  
 b) Obtain the conditions for alias free and perfect reconstruction of two channel QMF bank. [5]  
 c) Write short notes on wavelet reconstruction. [5]



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**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.E. I Year (ECE) I-Semester (Make Up) Examinations, March-2016**  
**(Embedded Systems & VLSI Design)**

**Digital IC Design**

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE questions from Part-B*

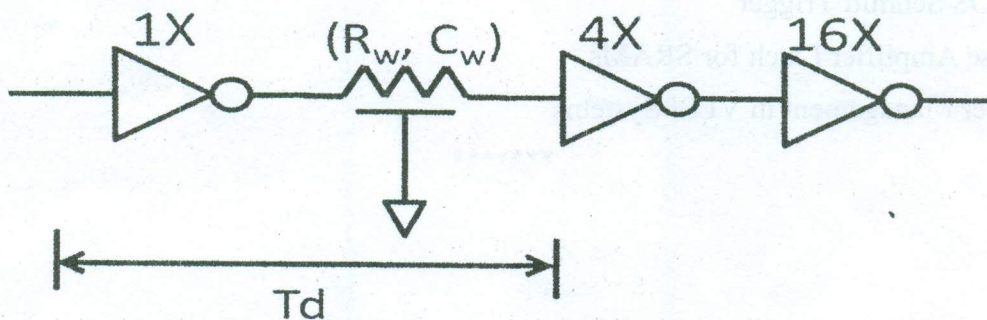
**Part-A (10 X 2=20 Marks)**

1. Define clock skew. How does it affect the performance of a VLSI system?
2. How does the VTC of a CMOS inverter change if the NMOS transistor is made stronger?
3. Compare and contrast both CMOS and pseudo-NMOS inverters. Draw their VTCs.
4. Estimate the intrinsic time constant of a balanced CMOS inverter.
5. Distinguish between a latch and a register with the help of a timing diagram.
6. Give the Elmore delay model for a 1 mm long interconnect split into 10 sections.
7. How does pipelining reduce power consumption in VLSI systems?
8. Draw a level restorer circuit and explain its working.
9. Why is a pre-decoder necessary for decoding Row address in SRAM structures?
10. Compare a 1T DRAM cell with a 6T SRAM cell with the help of circuit diagrams.

**Part-B (5 × 10 = 50 Marks)**

*(All bits carry equal marks)*

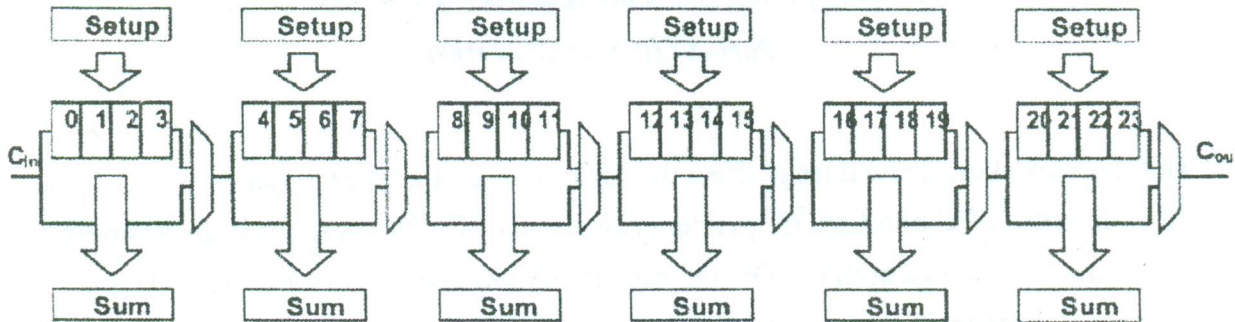
11. a) Compute the propagation delay,  $t_{pd}$  of a CMOS inverter in  $0.25 \mu$  technology. Plot the  $t_{pd}$  as a function of  $\beta$  and interpret the effect of sizing on propagation delay.  
 b) Design a pseudo-NMOS inverter for  $V_{OL} = 0.2V$  and  $t_{pHL} \leq 100$  ps. Assume  $C_L = 50$  fF.
12. a) Implement XOR/XNOR functions using CMOS and CPL gates and compare their performance.  
 b) An FO4 inverter chain is shown below. The first and second stages are connected by a  $100 \mu \times 0.25 \mu$  long poly wire. Calculate the  $T_{dLH}$  and  $T_{dHL}$  using  $0.25 \mu$  technology parameters. Assume  $R_w = 150 \Omega/\square$ ,  $C_w = 0.1$  fF/ $\mu^2$ ,  $R_{NMOS} = 10K$  and  $R_{PMOS} = 12K$  for a unit size inverter.



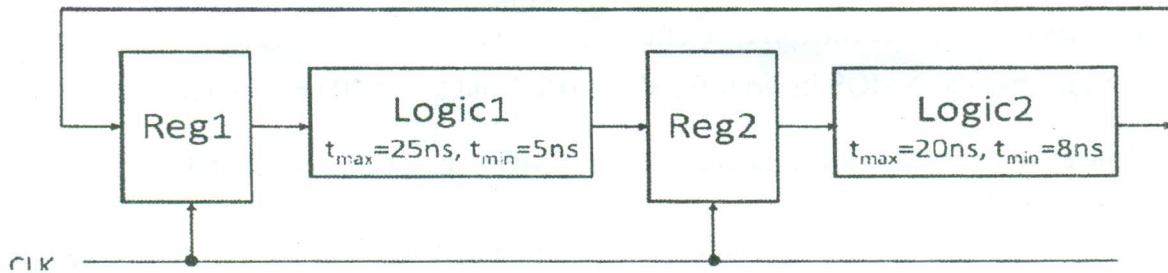
13. a) Give the schematic of a CMOS Dual Edge Triggered (DET) Register and show that its throughput is twice that of an edge triggered register. What is the trade off?  
 b) What are the challenges in distributing power and clock in a VLSI system? Give two clock distribution techniques followed in VLSI system design.



14. a) Explain the working principle of a 4 bit Manchester Carry chain adder and find its critical path delay. What are its limitations? How do you overcome them?  
 b) A 24 bit, 6 stage Carry Bypass adder with  $t_{setup} = 4ns$ ,  $t_{carry} = 1ns$ ,  $t_{sum} = 4ns$  and  $t_{bypass} = 2ns$  is given below. Identify the critical path and list the delays for each block along the critical path. Find the total delay assuming each stage bypasses the same number of bits.



15. a) Draw the circuit of a 3T DRAM cell and explain its Read/ write operations with the help of timing diagrams.  
 b) What is Memory Yield? What are the challenges and techniques in DSM regime for improving Memory Yield?
16. a) Show that for a balanced CMOS inverter  $NM_L = NM_H$  and  $t_{pHL} = t_{pLH}$ .  
 b) A pipelined system is shown below. Estimate the maximum frequency of operation of the system if there is no skew. Given  $t_{CLK-Qmax} = 4 ns$ ,  $t_{CLK-Qmin} = 2 ns$  and  $t_{setup} = t_{hold} = 1 ns$ , also estimate the maximum clock skew that the system can tolerate.



17. Write short notes on any **two** of the following:
- CMOS Schmitt Trigger
  - Sense Amplifier Latch for SRAMs
  - Power Management in VLSI Systems

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Hall Ticket Number:

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Code No.: 7121 M

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.E. I Year (EEE) I-Semester (Make Up) Examinations, March-2016**  
**(Power Systems & Power Electronics)**

**Power Semiconductor Devices and Circuits**

Time: 3 hours

Max. Marks: 70

Note: Answer ALL questions in Part-A and any FIVE questions from Part-B

**Part-A (10 X 2=20 Marks)**

- Complete the following sentences.
  - A power MOSFET is a ..... - polar device.
  - A power MOSFET is a ..... - controlled device.
- Draw the "Safe Operating Areas (SOAs)" of IGBT, both with forward-bias and reverse-bias.
- Explain in one or two sentences the purpose of using a high value inductor in the step-down IGBT chopper.
- Complete the sentence. "In a step-down chopper using an IGBT, a diode and an inductor, the main purpose of the diode is ....."
- Give the two disadvantages of a three-phase square-wave inverter.
- Give the definition of "modulation index" for the PWM control of inverter.
- Complete the sentence. "A resonant tank in a resonant converter contains at least two main components, which are ..... and ....."
- Complete the sentence. "The main function of resonant switch converter is to reduce the switching losses in the IGBTs by ....."
- Give in one sentence how the DC output voltage can be controlled in the Switched Mode Power Supply (SMPS).
- Complete the sentence. "The size of the power transformer in a Switched Mode Power Supply is reduced by operating the transformer at high ....."

**Part B (5 X 10= 50 Marks)**

- Give a neat sketch showing basic structure of a "Depletion Enhancement" MOSFET, and explain the operation of DE MOSFET in depletion mode only. (5)
  - Briefly explain the possibility of static latching up of IGBT. (5)
- A step-down chopper has a resistive load of 15 ohms and input voltage of 200 V. When the chopper remains ON, its voltage-drop is 2.5 V. The chopper frequency is 1000 Hz. For a duty-cycle of 50 %, calculate the average and RMS values of output voltage. (5)
  - Explain the principle of operation of a DC-to-DC converter circuit, where both step-up and step-down operations can be realized using only one chopper circuit. (5)
- For a three-phase bridge inverter, explain the operation of the inverter with  $180^\circ$  conduction mode with resistive load. (5)
  - For the inverter operation given in (a) above, draw the voltage waveforms of three phases and line. (5)



Hall Ticket Number:

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Code No.: 7123 M

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.E. I Year (EEE) I-Semester (Make Up) Examinations, March-2016**  
**(Power Systems & Power Electronics)**

**Power System Stability**

Time: 3 hours

Max. Marks: 70

Note: Answer ALL questions in Part-A and any FIVE questions from Part-B

**Part-A (10 X 2=20 Marks)**

1. Define stiffness of synchronous machine and write its significance.
2. Mention at least five counter measures used to avoid voltage instability of power system.
3. Write the typical inertia constants of the following synchronous machines
  - i) Turbine generator (condensing) with 1,800 rpm rating
  - ii) Turbine generator (condensing) with 3,000 rpm rating
  - iii) Turbine generator (non-condensing) with 30,000 rpm rating
  - iv) Water wheel generator with less than 200 rpm rating
  - v) Water wheel generator with more than 200 rpm rating
  - vi) Large synchronous condenser
4. Is transient stability limit more than steady state stability limit? Justify your answer.
5. Draw the block diagram of general electric hydraulic governor model for steam turbine.
6. Mention and write the values of different parameters of mechanical-hydraulic governor for steam turbine.
7. Why damper windings completely ignored in modelling of power system used for low frequency oscillation studies?
8. What is the role of supplementary excitation circuit in the operation of power system network?
9. What is the reason for sub synchronous resonance phenomenon in power systems?
10. Name at least four SSR countermeasures.

**Part-B (5 X 10=50 Marks)**

11. a) Define (i) dynamic stability (ii) steady state stability of power system network and also mention the different methods used to improve these stabilities. [5]  
b) Name any two different analysis of voltage stability study and explain about any one analysis. [5]
12. a) A 50 Hz, 500 MVA, 400 kV generator (with transformer) is connected to a 400 kV infinite bus bar through an interconnector. The generator has  $H=2.5$  MJ/MVA, voltage behind transient reactance of 450 kV and is loaded to 460 MW. The transfer reactances between the generator and busbar under pre-fault, during fault and post-fault are 0.5 pu, 1.0 pu and 0.75 pu respectively. Draw the swing curve using intervals of 0.05 sec and assuming that the fault is cleared at 0.15 sec, for a period of 0.3sec. [7]  
b) Define and derive steady state stability limit. [3]
13. a) Derive transfer function of all the components of Hovey's hydraulic power and governor system. [7]  
b) Obtain the potential energy function for a Static Var Compensator. [3]



14. a) From the fundamentals obtain values of constants  $K_1, K_2, K_3$  and  $K_4$  of transfer function of a power system model for low frequency oscillation studies. [7]  
b) Explain any two historical developments of Supplementary Excitation Control. [3]
15. a) Explain in detail about turbine generator torsional characteristics. [5]  
b) Explain characteristics of Series Capacitor Compensated Transmission Systems. [5]
16. a) How generator and loads are modelled for the study of voltage stability of a power system network? [3]  
b) Write an algorithm of Runge-Gutta method used to solve the swing equation. [7]
17. Write short notes on any **two** of the following:  
a) Natural oscillating frequencies in power system network. [5]  
b) Effect of governor of a hydroplant on system damping [5]  
c) Power system stabilizer [5]

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**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.E. I Year (EEE) I-Semester (Make Up) Examinations, March-2016**  
**(Power Systems & Power Electronics)**

**High Voltage DC Transmission**

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE questions from Part-B*

**Part-A (10 X 2=20 Marks)**

1. What are the types of DC links?
2. Explain the term short circuit ratio.
3. Write the equation of harmonic distortion.
4. Explain the drawbacks of IPC scheme.
5. What are the methods to control over voltages on DC system?
6. Draw the equivalent circuit of DC insulator string.
7. Draw the locus of power curve of a converter in  $P_d$ -  $Q_d$  plane.
8. Why reactive power sources are needed in HVDC system?
9. List out the advantages of MTDC systems.
10. What are different types of MTDC systems?

**Part-B (5 X 10=50 Marks)**  
**(All bits carry equal marks)**

11. a) State and explain the advantages and disadvantages of dc transmission system with respect to economics, reliability, stability and performance.  
 b) A monopolar HVDC link has one bridge at each terminal. The parameters of the link are  $\alpha_{min} = 5^\circ$ ,  $\gamma_{min} = 18^\circ$ ,  $R_d = 5\Omega$ ,  $R_{cr} = 10\Omega$ ,  $R_{ci} = 12\Omega$ ,  $V_{dor} = 115KV$ ,  $I_{ref}$  at the rectifier = 1KA,  $I_{ref}$  at the inverter = 900 A. If  $V_{doi} = 1117.5KV$ , Calculate  $I_d$ ,  $\alpha$ ,  $\gamma$ ,  $P_i$  and  $Q_i$ .
12. a) Explain the causes and elimination methods of non-characteristics harmonics.  
 b) Illustrate the Equidistance Pulse Control (EPC) by any two methods.
13. a) What are the causes for over voltages in DC systems? Discuss their effects.  
 b) Explain arc extinguishing method in DCCB.
14. a) Explain the torsional interactions in case of HVDC systems.  
 a) Explain briefly conventional control strategies of reactive power control in HVDC.
15. a) Discuss the operation and control of MTDC systems.  
 b) Draw and explain the block diagram of 4-terminal current order model in MTDC system.
16. a) Explain briefly the modern trends in HVDC system.  
 b) Discuss the extinction angle control in case of HVDC transmission system.
17. Write short notes on any **two** of the following:
  - a) Harmonic over voltages excited by AC disturbances
  - b) Harmonic interaction with HVDC system
  - c) Compact converter stations

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Hall Ticket Number:

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Code No.: 7122 M

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.E. I Year (EEE) I-Semester (Make Up) Examinations, March-2016**  
**(Power Systems & Power Electronics)**

**Application of Power Electronics to Power Systems**

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE questions from Part-B*

**Part-A (10 X 2=20 Marks)**

1. List the benefits of FACTS controllers.
2. List the various limitations of Present transmission network.
3. Describe the objectives of shunt compensation.
4. Explain the concept of Power oscillation Damping.
5. Explain the basic operating principle of Thyristor controlled series capacitor (TCSC).
6. How to improve the transient stability by using series compensation? Explain in brief.
7. Explain basic operating principle of Unified power flow controller.
8. Sketch the block diagram of shunt VSC controller of UPFC.
9. Explain the differences between Active and Passive filters.
10. Why harmonics are harmful to the system?

**Part - B (5 X 10=50 Marks)**  
**(All bits carry equal marks)**

11. (a) List the various factors that limit the loading capabilities of transmission line and explain.  
(b) Write short notes on different types of FACTS controllers.
12. (a) Derive Transfer function and explain dynamic performance of Static VAR compensation.  
(b) Explain the effect of shunt compensation at the end of a radial line on voltage stability.
13. (a) Describe the operating principle of static series synchronous compensator with neat block diagram.  
(b) Analyze the performance characteristics of TSSC.
14. (a) Illustrate the conventional transmission control capabilities of the UPFC through Phasor Diagram.  
(b) Explain, How UPFC is employed to control real and reactive power flow independently?
15. (a) Define the following power system quantities (i) Voltage Sag (ii) Voltage swell (iii) voltage Noise (iv) Displacement Power factor (v) Distortion factor  
(b) Explain the following (i) Harmonic sources from commercial loads (ii) Harmonic sources from industrial loads.
16. (a) List the applications of FACTS controllers and explain.  
(b) Define the regulation slope. Explain with V-I characteristics of the SVC and STATCOM.
17. (a) Explain the operation of GTO Thyristor-controlled series capacitor.  
(b). Derive the active and reactive power equations and draw the power angle characteristics of a two machine model interconnected power system.

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Hall Ticket Number:

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Code No.: 8124 M

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.E. I Year (Mech.) I-Semester (Make Up) Examinations, March-2016**  
**(Advanced Design & Manufacturing)**

**Computer Integrated Design and Manufacture**

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE questions from Part-B*

**Part-A (10 X 2=20 Marks)**

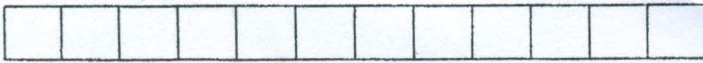
1. What is a geometric modeling? Explain
2. List out assembly constraints.
3. Explain agile manufacturing.
4. Explain design drafting interface.
5. Write rapid tooling.
6. Explain requirements for automated inspection.
7. Explain production planning.
8. Discuss material handling requirements.
9. Define MAN, WAN, LAN.
10. Describe the CIM models.

**Part-B (5 X 10=50 Marks)**  
**(All bits carry equal marks)**

11. a) Draw and explain product life cycle.  
b) Explain wireframe, surface and solid modeling techniques with examples.
12. a) What are NURBS? Explain Bezier and B. Spline curves and their continuity?  
b) Define optimization. Explain it with CAE approach.
13. a) Sketch Adaptive control machining and explain.  
b) What is DNC? Explain the methods of DNC Systems.
14. a) What is lean manufacturing? Explain in detail.  
b) Explain any one method of rapid prototyping technique with a neat sketch
15. a) Discuss with an example Reverse Engineering Approach.  
b) Describe Top down and Bottom up Assembly.
16. a) Explain in detail material requirement planning.  
b) Explain CIM and enumerate the elements, advantages and limitations of CIM.
17. a) What are the databases and networks used in CIM?  
b) What is AC? Explain various controls used in CNC and DNC?

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Code No.: 5125 M

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.E. I Year (ECE) I-Semester (Make Up) Examinations, March-2016**  
**(Communication Engineering & Signal Processing)**

**Global Navigational Satellite Systems**

Time: 3 hours

Max. Marks: 70

Note: Answer ALL questions in Part-A and any FIVE questions from Part-B

**Part-A (10 X 2=20 Marks)**

1. Discuss in brief the principle of Hyperbolic navigation.
2. Determine the orbital period of a GPS satellite, if the semi major axis,  $a = 2.6369 \times 10^7$  m, and Earth's Gravitational Constant,  $GM = 3.98 \times 10^{14}$  m<sup>3</sup>/sec<sup>2</sup>.
3. Compute the chip length of C/A code and P code.
4. What is the difference between an ellipsoid and geoid?
5. If TEC is  $2.86 \times 10^{18}$  el/m<sup>2</sup>, calculate the ionospheric time delay on L<sub>1</sub> frequency.
6. What is multipath? How does it affect the GPS range measurements?
7. Mention various errors affecting the accuracy of DGPS system.
8. What are the salient features of GPS carrier phase measurements?
9. Explain why augmentation is necessary for GPS.
10. Mention the names of any three augmentation systems being implemented around the world.

**Part-B (5 X 10=50 Marks)**

11. a) Describe the classical orbital parameters (Keplerian elements) with the help of a neat diagram giving relevant equations with respect to GPS. [6]  
b) Explain the principle of operation of GPS with the help of a neat diagram. [4]
12. a) With the help of a neat block diagram, list out the important components of a GPS receiver and explain their functions. [6]  
b) If the ECEF coordinates of a point are  $X = 4,91,185.35$  m,  $Y = 5,614,274.28$  m,  $Z = 2,976,505.27$  m, determine the WGS-84 latitude and longitude. [4]
13. a) Given the measured rms errors of i) pseudorange,  $\sigma = 1.2$  m, ii) user position in x, y and z directions,  $\sigma_x = 1.5$  m,  $\sigma_y = 1.4$  m,  $\sigma_z = 1.8$  m respectively, and iii) user clock error expressed in distance,  $\sigma_b = 0.8$  m, calculate GDOP, PDOP, VDOP, HDOP and TDOP. [5]  
b) Describe how the ionosphere and troposphere affects the GPS signal as it travels from the satellite to receiver. [5]
14. a) Explain the architecture and principle of operation of DGPS with the help of a neat diagram. [6]  
b) What is RINEX? Discuss in brief about RINEX observation and Navigation formats. [4]
15. a) Discuss about WAAS with the help of neat diagram. [6]  
b) Compare the salient features of GPS, GLONASS and Galileo satellite constellations. [4]
16. a) With the help of a neat diagram explain the principle of operation of Transit navigation system. [5]  
b) Explain the significance of WGS-84 reference system. [5]
17. Write short notes on any two of the following:  
a) GPS-GIS integration [5]  
b) Significance of DOP in position estimation [5]  
c) Future GPS signals [5]

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**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.E./M.Tech. I Year I-Semester (Make Up) Examinations, March-2016**

**Finishing School-I**

Time: 1½ hours

Max. Marks: 35

*Note: Answer ALL questions in Part-A and any FIVE questions from Part-B*

**Part-A (10 X 2=20 Marks)**

- Complete the conversations: [2]
  - Nina : \_\_\_\_\_  
 Mark : That's because they never stop criticizing me.  
 Nina : Why don't you try telling them how you feel about it?  
 Mark : Do you think I haven't? They just don't care about how I feel.  
 (1) Why are you always complaining about your parents?  
 (2) Why are the policemen running around?  
 (3) What's the reason for her aggressive behavior?  
 (4) What makes you think that the exam questions will be difficult?  
 (5) Are your parents aware of the problems you are going through?
  - Peter : \_\_\_\_\_  
 Andrew : No, I'm okay. I can wait until the end of the meeting.  
 Peter : I don't think so. You can't keep your eyes open.  
 Andrew : I guess you're right. I'll see you tomorrow.  
 (1) Are you feeling better today than yesterday?      (2) You had better go home and take a rest.  
 (3) Can you tell me why you're smiling all the time?      (4) Do you mind if I ask you a personal question?  
 (5) Is it possible for you to wait for the end of the meeting?
- Put the sentences in the correct order to make a meaningful paragraph: [2]
  - (A) The two neighbours never fought each other.  
 (B) Fights involving three male fiddler crabs have been recorded, but the status of the participants was unknown.  
 (C) They pushed or grappled only with the intruder.  
 (D) We recorded 17 cases in which a resident that was fighting an intruder was joined by an immediate neighbour, an ally.  
 (E) We therefore tracked 268 intruder males until we saw them fighting a resident male.  
 The correct order is: (1) BEDAC (2) DEBAC (3) BDCAE (4) BCEDA
  - (A) He felt justified in bypassing Congress altogether on a variety of moves.  
 (B) At times he was fighting the entire Congress.  
 (C) Bush felt he had a mission to restore power to the presidency.  
 (D) Bush was not fighting just the democrats.  
 (E) Representative democracy is a messy business, and a CEO of the White House does not like a legislature of second guessers and time wasters.  
 The correct order is: (1) CAEDB (2) DBAEC (3) CEADB (4) ECDBA
- Choose the correct option: [2]
  - Companies conduct group discussion after the written test to know more about your:
    - Interactive Skills (how good you are at communication with other people)
    - Behavior (how open-minded are you in accepting views contrary to your own)
    - Participation (how good an active speaker you are & your attention to the discussion)
    - Contribution (how much importance do you give to the group objective as well as your own)
    - All of the above
  - Aspects which make up a Group Discussion are:
    - Verbal Communication      (2) Non-verbal behavior      (3) Confirmation to norms
    - Decision making ability      (5) Cooperation      (6) All of the above
- Identify the correct phrasal verb to complete the sentence and mention the meaning it conveys: [2]
 

Pick up, hang up, take down, put on, take off

  - Your clothes are on the floor \_\_\_\_\_.
  - She \_\_\_\_\_ the phone before I could say goodbye.
  - People \_\_\_\_\_ their Christmas decorations twelve days after Christmas.
  - She \_\_\_\_\_ French in six months.
- Fill the gaps with appropriate words from the given list: [2]
 

advise appointment currently external matter wish

Our company is (1) \_\_\_\_\_ renewing its provision of telephones for both internal and (2) \_\_\_\_\_ communication. I (3) \_\_\_\_\_ to enquire about the possibility of one our your representatives visiting the company to (4) \_\_\_\_\_ us about the number and type of telephones we would need to provide us with a modern communication system.  
 Perhaps you could telephone my secretary to arrange an (5) \_\_\_\_\_ to call and discuss the with me in the near future.



## Part-B (5X5=25 Marks)

6. a) Complete the conversations: [2]
- (1) A mechanic is fixing your car. You need to use your car so you ask the mechanic: \_\_\_\_\_  
 (A) When will my car be ready? (B) Who is the new mechanic?  
 (C) Why do you like fixing cars? (D) How many cars are you fixing?
- (2) The manager asks the secretary to answer the phone. The manager says to the secretary: \_\_\_\_\_  
 (A) Why is the phone ringing? (B) The telephone is not being used.  
 (C) The phone is on the table. (D) Please answer the phone.
- b) Complete the conversations: [3]
- Hong : There's a terrible smell coming from somewhere. Do you know where it is coming from?  
 Zarina : Oh! It's from the uncollected rubbish heap over there. \_\_\_\_\_ 1 \_\_\_\_\_ (To complain)  
 Hong : The stench is unbearable. \_\_\_\_\_ 2 \_\_\_\_\_ (To clarify). At least that was what I thought.  
 Zarina : \_\_\_\_\_ 3 \_\_\_\_\_ (To compare) Nowadays, they are not regular at all.  
 Hong : I think we should complain to the relevant authorities. Otherwise, diseases will spread rapidly.
- (1) To complain  
 (A) Great! Now that's what we need.  
 (B) The garbage collectors are so lazy and irresponsible.  
 (C) This neighborhood used to be the cleanest.  
 (D) Isn't anybody doing anything about it?
- (2) To clarify  
 (A) Who's throwing the rubbish there? (B) Did you see the culprits?  
 (C) Isn't rubbish supposed to be collected on Mondays and Thursdays?  
 (D) How can people be so indifferent to this problem?
- (3) To compare  
 (A) They used to be very efficient. (B) Now they have disappeared.  
 (C) The whole neighborhood looks disgusting.  
 (D) I hope that the authorities will do something about it.
7. a) Read the passages given below and tick the statement that the paragraph best supports: [2]
- i) More and more office workers telecommute from offices in their own homes. The upside of telecommuting is both greater productivity and greater flexibility. Telecommuters produce, on average, 20% more than if they were to work in an office, and their flexible schedule allows them to balance both their family and work responsibilities.  
 The paragraph best supports the statement that telecommuters  
 (A) get more work done in a given time period than workers who travel to the office.  
 (B) produce a better quality work product than workers who travel to the office.  
 (C) are more flexible in their ideas than workers who travel to the office.  
 (D) would do 20% more work if they were to work in an office.
- ii) Sushi, the thousand-year-old Japanese delicacy, started small in the United States, in a handful of restaurants in big cities. Today, sushi consumption in America is 50% greater than it was ten years ago and not just in restaurants. Sushi is also sold at concession stands in sports stadiums, university dining halls, and in supermarkets throughout the country.  
 This paragraph best supports the statement that  
 (A) sushi is now a fast food as popular as hot dogs, burgers, and fries.  
 (B) more sushi is sold in restaurants than in supermarkets.  
 (C) Americans are more adventurous eaters than they were in the past.  
 (D) sushi wasn't always widely available in the United States.
- b) In each of the following items some parts have been jumbled up. You are required to re-arrange these parts which are labeled P,Q,R,S to produce the correct sentence. [3]
- i) Violence  
 P: even before she is born Q: and can happen throughout a women's life  
 R: against women S: takes many forms.  
 (1) RPSQ (2) PQSR (3) RSQP (4) SQRQ (5) None of these
- ii) With  
 P: the new Bill in the parliament Q: experts are expected  
 R: the passage of S: to get a fill up  
 (1) QSRP (2) PRQS (3) QRPS (4) PSQR (5) None of these.
- iii) The  
 P: plucked up courage to Q: to reflect global realities  
 R: government has at last S: increases domestic fuel prices  
 (1) RSPQ (2) QPSR (3) PRSQ (4) QSPR (5) None of these.
8. a) Write a short note on why Group Discussions are conducted? [3]  
 b) Choose the correct option: [2]  
 i) The group discussion evaluates the candidate's ability to:  
 (A) argue with others (B) control others  
 (C) lead others (D) confer with others on a given subject



- i) The first objective in a group discussion is to:  
 (A) prove your superiority (B) catch the group's attention  
 (C) create sub-groups (D) act as a self-appointed leader of the group

a) Spot the error in the sentence: [3]

- i) They grew (A)/ such a lot (B)/ since we last (C)/ saw them.(D)/ No error (E)  
 (1) A (2) B (3) C (4) D (5) E  
 ii) We didn't even start (A)/ the test when she told us (B)/ there wasn't any time left. (C)/ No error. (D)  
 (1) A (2) B (3) C (4) D  
 iii) It came to (A)/ my notice(B)/ lately (C)/ No Error (D)  
 (1) A (2) B (3) C (4) D

b) i) World renowned country western super group The Mountain Boys can sell out an arena **at the drop of a hat.** [1]

- (1)The Mountain Boys may be able to sell out an arena, but it will take a long time.  
 (2)The Mountain Boys can sell out an arena very quickly.  
 (3)The Mountain Boys are always willing to perform at charity events.  
 (4)The Mountain Boys enforce a dress code at all of their shows.

ii) Vivian expected Craig to sob uncontrollably when she broke up with him; however, Craig **kept a stiff upper lip.** [1]

- (1) Craig cried even more than Vivian had expected.  
 (2) Craig cried about as much as Vivian had expected.  
 (3) Craig cried a little less than Vivian had expected.  
 (4) Craig did not cry.

10. a) Use the verbs from the box below to fill in the spaces in the letter which Sara writes to Jackie. Be careful of the third person "s"! [3]

play like work want (x2) say have come go (x2) meet live

Hi Jackie,

How are you? I'm very well. I (1) \_\_\_\_\_ to tell you something about the person who (2) \_\_\_\_\_ with me here in my apartment. His name is Mike and he (3) \_\_\_\_\_ from Canada. He is 27 and he (4) \_\_\_\_\_ in a big hotel near the center of the city. He really (5) \_\_\_\_\_ his job and he (6) \_\_\_\_\_ it because he (7) \_\_\_\_\_ a lot of new people every day from many different countries. On the weekend, he (8) \_\_\_\_\_ swimming and sometimes we (9) \_\_\_\_\_ tennis or (10) \_\_\_\_\_ windsurfing together. He (11) \_\_\_\_\_ a very pretty girlfriend called Janet and they (12) \_\_\_\_\_ to get married next year! OK, that's enough for now. Write soon.  
 Sara.

b) Look at the words in the table and decide which word will fit in the reading gap fill summary. Type the word into the gap (when you have completed it you can click below to reveal and check your answers). [2]

Predicted	rose	incident	passenger	found	assault
Established	occurring	hoped	increased	injury	passengers

Summary

The first time that an (1) \_\_\_\_\_ of air rage was recorded was in the 1940's, but the passenger was never actually charged for an offence because there were no clear rules in place to specify where to prosecute. It was later (2) \_\_\_\_\_ that it would be the country where the plane is registered. Air rage has (3) \_\_\_\_\_ significantly since this time, growing by a staggering 400% from 1995 to 1998. Air rage is (4) \_\_\_\_\_ to be a major problem in the future as air travel increases, as do levels of aggression. Angry (5) \_\_\_\_\_ can put everyone in danger including the pilots, the crew and the other passengers, with some form of (6) \_\_\_\_\_ being the most common consequence.

11. a) From the options A, B, C and D, choose the correct function of the underlined statements. [3]

- Rohana How was the opening ceremony?  
 Faridah It was a fantastic spectacle. I don't think I'll be able to describe it to you fully.  
 Rohana Oh, how I wish I were participating in the ceremony. As it was, I couldn't even watch the ceremony on television.  
 Faridah Don't worry, you can watch it on videotape. My father taped the live telecast.  
 Rohana That's good news. But I don't think it's as exciting as watching it live.

- (1) How was the opening ceremony?  
 (A) To request (B) To inform (C) To describe (D) To enquire  
 (2) It was a fantastic spectacle.  
 (A) To praise (B) To wish (C) To suggest (D) To advise  
 (3) That's good news.  
 (A) To express ignorance (B) To express relief  
 (C) To express delight (D) To express gratitude



- b) Read the passages and choose the correct options according to the readings. [2]

One of my favorite vacation places is Mexico. I really like the weather there because it never gets cold. The people are very nice too. They never laugh at my bad Spanish. The food is really good. Mexico City is a very interesting place to visit. It has some great museums and lots of fascinating old buildings. The hotels are too expensive to stay but there are more affordable options. For example, you can stay at one of the beach resorts like Acapulco. If you are planning to visit Mexico, you should definitely see the Mayan temples near Merida.

- i) (A) Sam likes warm weather (B) Sam doesn't like warm weather at all  
(C) Sam hates warm water (D) Sam likes cold weather  
ii) (A) His Spanish is very good (B) He speaks Spanish very well  
(C) He is Spanish (D) He doesn't speak Spanish very well

12. Answer any **two** of the following: [5]

- a) Write an essay of about 300 – 350 words on the topic Technology and its impact.

- b) TeleTech Corporation

Application for the position of Java Developer – Ref no : 12345

We are looking for M.Tech/ MCA graduates fresher candidates with the following skill set:

- Must have basic knowledge of HTML, XHTML, CSS,
- The person should be technically sound (. Net \ Java and SQL Server) and should be able to be quickly productive and need minimum hand-holding.
- Must be Proactive and exhibit effective inter-personal and communication skills
- Develop and deliver quality code adhering to the standards.

Interested candidates need to apply by sending their resume and other details to [XYZ@talentech.com](mailto:XYZ@talentech.com)

Email Writing - Instruction Sheet

Task Requirement: Read the given job advertisement. You are the right candidate for the job, you have all the required skills and traits. Write an email responding to this job advertisement. You will be given 15 minutes to write this email.

Subject Line : The subject line has to be clear and relevant.

Content : The email has to be written keeping the following in mind.

- Appropriate greeting
- Details covering all the points in the advertisement
- appropriate close and action plan

Sentence structure : Use correct sentence structure, spelling and punctuation.

Vocabulary and Tone : Use words that express your request clearly

- c) Imagine that you are giving a speech on "The effects of pollution on the environment". Write a script for your speech in about 150-200 words.

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Hall Ticket Number:

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Code No.: 9125 M

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.Tech. I Year (CSE) I-Semester (Make Up) Examinations, March-2016**

**Mobile Computing**

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE questions from Part-B*

**Part-A (10 X 2=20 Marks)**

1. Why we say that mobile elements are resource-poor relative to static elements?
2. Can we say CSMA/CA prevents collisions? Justify.
3. What are different interleaving and repetition schemes applied by DAB to objects and segments?
4. How privacy is provided in GSM?
5. How many channels exist between 5500MHz and 5725MHz with 16MHz for each channel? Consider 20MHz for spacing between channels.
6. Write the applications of Adhoc networks.
7. What is CoA in mobile IP?
8. State the layers in WAP Architecture.
9. What is the latest version of iOS in the market? Which programming language is used to build an iOS app?
10. List the protocols used in mobile commerce.

**Part-B (5 X 10=50 Marks)**

11. a) Briefly describe FHSS and DSSS with neat diagrams. [6]  
b) Given a channel with an intended capacity of 30 Mbps, the bandwidth of the channel is 3 MHz. What is the signal to noise (S/N) ratio required to achieve this capacity? [4]
12. a) Why GSM is also called 2G? Explain its architecture and services. [5]  
b) What do you mean by multiple access? Explain how CDMA make use of vector multiplication technique to send unique signals on air. [5]
13. a) Differentiate piconet and scatternet in Bluetooth technology. What are the new specifications supported by current Bluetooth? [6]  
b) Describe the MAC mechanism DFWMAC with RTS/CTS extension. [4]
14. a) What are the different kinds of broadcast models? Explain the model in which the server disseminates information using a periodic and aperiodic broadcast program [6]  
b) Wireless Application Protocol (WAP) is a technical standard for accessing information over a mobile wireless network. Justify [4]
15. a) Explain the recovery model for Mobile Transactions. [5]  
b) What's the difference between a Mobile Website and an App? Which is Better – an App or a Mobile Website? [5]
16. a) Explain different modulation techniques in detail. [6]  
b) Discuss the handover mechanisms in satellite systems. [4]
17. Write short notes on any two of the following:
  - a) IEEE 802.11a [5]
  - b) Mobile IP [5]
  - c) Android development tools. [5]

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Code No. : 6212

**VASAVI COLLEGE OF ENGINEERING (*Autonomous*), HYDERABAD**  
**M.E. I Year (ECE) II-Semester (Main) Examinations, July-2016**  
(Embedded Systems & VLSI Design)

**Embedded Real Time Operating Systems**

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE from Part-B*

**Part-A ( $10 \times 2 = 20$  Marks)**

1. Suppose a new process in a system arrives at an average of six processes per minute and each such process requires an average of 8 seconds of service time. Estimate the fraction of time the CPU is busy in a system with a single processor.
2. What is preemptive scheduling? Explain with an example.
3. Why the communication between any two processes is required? Give an example for such a method.
4. What are relative deadlines and absolute deadlines of a task? How are they considered in an EDF algorithm?
5. Define Zombie state of a process in Linux.
6. Draw the architecture of Linux.
7. What is the use of a device tree in device drivers?
8. When do we need mknod in Linux?
9. Draw the state transition diagram in VxWorks.
10. List the different types of semaphores used in VxWorks RTOS. Which is the fastest?

**Part-B ( $5 \times 10=50$  Marks)**

11. a) What is a kernel? Classify them. [4]  
b) Explain the use of RTOS by taking one practical example and also brief why can't we use GPOS in that example. [6]
12. a) In the following, the partial behavior of a telephone system is given. [6]
  - i) If you press the button of the handset for less than 15 sec it connects to the local operator. If you press the button for any duration lasting between 15 to 30 sec, it connects to the international operator. If you keep the button pressed for more than 30 sec, then on releasing it would produce the dial tone.
  - ii) Once the receiver of the handset is lifted, the dial tone must be produced by the system within 20 sec, otherwise a beeping sound is produced until the handset is replaced.  
Draw the EFSM model for telephone system (above two cases).
- b) How does a semaphore overcome the shared data problem? [4]
13. a) What are system calls and how system calls are implemented in Linux? [5]  
b) List the various memory management algorithms used in Linux. [5]



14. a) Briefly write about Device drivers in user space and kernel space. [5]  
b) Distinguish vmalloc and kmalloc. Which one is preferred to use in device drivers? [5]
15. a) List the important features of  $\mu$ COS. [5]  
b) Compare and contrast between the interprocess communication methods of VxWorks,  $\mu$ cos and RTLinux. [5]
16. a) Explain priority inversion in the context of real-time scheduling. [5]  
b) Describe the Rate Monotonic Scheduling algorithm with an example. [5]
17. Write short notes on any *two* of the following:
- a) Shell programming [5]  
b) Pipes in Linux. [5]  
c) Memory management in RTLinux. [5]

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Code No.: 5212 M

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.E. I Year (ECE) II-Semester (Make Up) Examinations, August-2016**  
**(Communication Engineering & Signal Processing)**

**Wireless Communications and Networking**

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE from Part-B*

**Part-A (10 X 2=20 Marks)**

1. Give the mathematical model of Jakes channel.
2. Draw the block diagram of RAKE demodulator.
3. Give the merits of FDMA over TDMA.
4. Distinguish between fixed channel assignment and dynamic channel assignment.
5. If a base station covers 1 Km radius in a plain open area modelled as a 2-ray channel, what would be the coverage if it was used with free space communications?
6. What is Mobile IP?
7. A hexagonal cellular system has a cluster size of 4 cells as the basic model for frequency reuse implementation. Calculate reuse distance, if the radius of the hexagonal cell is 5 Km.
8. Discuss mobility management.
9. Compare piconet and scatternet in Bluetooth.
10. Calculate the time separation required for two signals to achieve a high degree of time diversity in a classical Rayleigh channel at 900 MHz with a mobile speed of 10 Km/ hour.

**Part-B (5 × 10=50 Marks)**

**(All bits carry equal marks)**

11. a) What is small scale fading? Classify and describe different types of small scale fading channels.  
b) Given that transmitter radiates carrier frequency of 1550 MHz and vehicle speed is 50 mph, calculate the receiver carrier frequency, if mobile is moving towards and away from transmitter.
12. a) Find out and analyse the space time OFDM and space diversity techniques.  
b) Compare diversity techniques and channel coding techniques.
13. a) What is handover? Classify handover mechanisms and explain them.  
b) Compare the interface specifications of CDMA and GSM.
14. a) Describe the significance of transport layer protocols.  
b) Analyse packet error modeling on fading channel.
15. a) Describe about the routing techniques of wireless adhoc network.  
b) Compare IS 95 and GPRS wireless data networks.



16. a) Derive the expression for received signal power for 2-ray ground reflected propagation model with the help of neat diagram.  
 b) Compare Erlang capacity of FDMA and TDMA access techniques.

17. Answer any **two** of the following:

- a) Coherence bandwidth and coherence time.  
 b) A cellular system uses a frequency reuse factor of 1/4. If the path loss exponent is 4 and cell radius is 5 km, estimate the following:  
 i) SIR of the system with no cell sectoring.  
 ii) SIR of the system with 60° cell sectoring.  
 iii) SIR of the system with 120° cell sectoring.  
 c) Describe the concept of frequency reuse factor with an example.

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