(DEC 411)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Final Year)

ELECTRONICS AND COMMUNICATION ENGG.

Paper – I : Industrial Management

Time : 3 Hours   Maximum Marks: 75

Answer question No.1 is compulsory and Four from remaining

All questions carry equal marks   *(5×15 = 75)*

1) Write short notes on:

   a)   Job analysis.

   b)   Channels of distribution.

   c)   Sales Promotion.

   d)   Present worth.

   e)   Types of depreciation.

2) What is management? "Management is considered to be both Science and Art"- Explain?

3) Define Partnership? Write the differences between private limited and public limited companies.

4) What is a future worth? Explain the usage of cash flow diagram for calculating Net present value.

5) Explain the importance of depreciation and explain any two methods of depreciation briefly?

6) What are the various types of production systems and explain them in detail?

7) What is Job design? What are the personnel functions in Industrial organisation?

8) What is an Inventory? Explain any two types of Inventory management.

9) Explain with a neat sketch about product life cycle? And define Market Research.

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(DEC 412)

Time : 3 Hours   Maximum Marks: 75

Answer question No.1 is compulsory   *(15)*

Answer one question from each unit   *(4×15 = 60)*

1)   a)   Define Prograde and Retrograde.

    b)   What do you mean by elevation angle and slant range.

    c)   What is meant by Earth station look angles.

    d)   Define Quantization.

    e)   What is a multiplexer.

    f)   What do you mean by Traffic Burst.

    g)   What is Guard time estimation.

    h)   Define EIRP.

    i)   What are different types of SDMA.

UNIT - I

2)   a)   Discuss the orbital effects in communication system perform of a satellite.

    b)   How do you locate the satellite with respect to the earth.

<div align="center">OR</div>

3)   a)   Write short notes on launch and launch vehicles.

    b)   Give a brief history of satellite communications.

UNIT - II

4) a) Explain how attitude and orbit control is achieved from an earth station.

b) Compare CDMA and FDMA.

OR

5) a) Write short notes on power systems used in satellite.

b) Explain the features of FDMA.

UNIT - III

6) a) A receiving system shown in figure has antenna noise temperature $60^{o}K$ and receiver noise figure 9 dB. Find the system noise temperature.

b) Explain the features of VSAT.

OR

7) a) Obtain an expression for carrier to noise ratio and G/T of a receiving system.

b) Discuss how antenna tracking is carried out at earth station.

UNIT - IV

8) a) Explain slow frequency hopping.

b) Write short notes on THSS.

OR

9) a) Discuss the practical jammer types.

b) Give the significance of processing gain.

EEE

B. Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Final Year)

ELECTRONICS AND COMMUNICATION ENGG.

Paper – III : Microwave Engineering

Time : 3 Hours   Maximum Marks: 75

Answer question No.1 is compulsory   ***(15)***

Answer one question from each unit   ***(4×15 = 60)***

1)   a)   Write down the principle of velocity modulation in two Cavity Klystron?

    b)   Explain the principle involved in O type M type microwave tubes?

    c)   Draw the schematic of electron path in cylindrical magnetron?

    d)   Draw the two hole directional coupler and express the spacing between the center of two holes in directional coupler?

    e)   Mention principle involved in circulator and write down the simplified S-matrix of it?

    f)   Draw voltage and current waveforms of TRAPATT diode?

    g)   Calculate the operating frequency of silicon READ diode with drift i region length 3μm?

    h)   List out the specifications of pins of Reflex Klystron power supply?

    i)   Explain the use of PIN diode in the microwave bench?

UNIT - I

2)   a)   Explain in detail (quantitative and qualitative) velocity modulation process in Reflex Klystron?

b) A two cavity Klystron amplifier has the following parameters: $V_0 = 1000V$, $I_0 = 25mA$, $R_0 = 40 k\Omega$, $f = 3GHz$, $d=1mm$, $L = 4cm$, $R_{sh} = 30k\Omega$.

    i) Find the input gap voltage to give maximum voltage V2.

    ii) Find the voltage gain, neglecting the beam loading in the output cavity.

    iii) Find the efficiency of the amplifier, neglecting the beam loading.

    iv) Calculate the beam loading conductance?

OR

3) a) Draw the schematic of linear model of M-carcinotron and explain how energy is transferred to RF field?

b) A circular carcinotron has the operation parameters: $V_0 = 20kV$, $I_0 = 4.5A$, $f=8$ GHz, $B_0 = 0.3Wb/m^2$, $Z_0 = 50\Omega$, $D = 0.8$, $b = 0.5$. Compute

    i) the Dc electron velocity

    ii) the electron beam phase current

    iii) the delta differentials

    iv) the propagation constant

    v) the oscillation condition?

UNIT - II

4) a) Draw the schematic of Magic Tee along with field patterns? Write down its characteristics and S matrix?

b) An air filled wave guide with a cross section 2X1 cm transports energy in TE_{10} mode at the rate of 0.5hp. The impressed frequency is 30 GHz. What is the peak value of the electric field occurring in the guide?

OR

5) a) Draw the schematic and explain the operation of microwave isolator?

b) Derive the S matrix for directional coupler?

UNIT - III

6) a) Explain characteristics of microwave tunnel diode and obtain the expression its resonance frequency?

b) A typical n-type GaAs Gunn diode has the following properties: $E_{th} = 2800$V/cm, $E = 3200$V/cm, $L = 10\mu$m, $n_0 = 2\times10^{16}$ cm^{-1}, $f = 10$ GHz.

    i)   Compute elector drift velocity

    ii)   Calculate the current density

    iii)   Estimate the negative electron mobility?

OR

7) a) Explain about physical structure and negative resistance of IMPATT diode?

b) An IMPATT diode has the following properties: $V_d = 2\times10^7$ cm/s, $L = 6\mu$m, $V_{omax} = 100$V, $I_{omax} = 200$mA, $\eta = 15\%$, $V_{bd} = 90$V. Calculate

    i)   the max CW power in watts

    ii)   the resonant frequency in GHz

    iii)   drift time?

UNIT - IV

8) a) Draw and explain about each block in the block diagram of microwave bench setup using reflex klystron to measure directivity of directional coupler?

b) Explain the use of cavity frequency resonator in microwave bench?

OR

9) a) Draw and explain about each block the block diagram of microwave bench setup using GUNN diode for VSWR measurement of SHORT?

b) Explain in detail about the power setup using reflex klystron power supply?

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(DEC 414)

B. Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Final Year)

ELECTRONICS AND COMMUNICATION ENGG.

Paper – IV : Antennas and Propagation

Time : 3 Hours   Maximum Marks: 75

<u>*Answer question No.1 is compulsory*</u>   *(15)*

<u>*Answer one question from each unit*</u>   *(4×15 = 60)*

1) a) Define virtual height of antenna?

   b) Define maximum usable frequency and derive relation between maximum usable frequency and critical frequency.

   c) Define circular polarization?

   d) Define Radiation resistance and find the value of radiation resistance of half wave dipole?

   e) What type of antennas are preferred for TV receiver.

   f) What kind of polarisation occurs with helical antenna?

   g) What is use of zoning in dielectric antenna?

   h) Explain basic principle involved in slot antenna?

   i) Express the relationship between power gain and directive gain?

   j) Define radiation pattern, sketch it and indicate, BWFN, HPBW, side lobe, major lobe, back lobe?

   k) What is the purpose of top loading the antenna?

2) a) Derive power radiated by a current element and its radiation resistance?

b) Find the gain, beam and capature area for a parabolic antenna with a 6 meters diameters dish and dipole fed at a frequency of 10 GHz?

OR

3) a) Explain about travelling wave antennas along with radiation patterns for travelling wave antenna of different lengths?

b) In a Microwave communication link, two identical antenna operating at 10GHz are used with power gain of 40dB. If the transistor power is 1W, Find the received power, if the range of the link is 30km?

UNIT - II

4) a) Explain about arrays of two point sources with equal amplitude and opposite phase, sketch its field pattern? Derive

i) Maximum direction

ii) Minimum direction and

iii) Half power point directions

b) Explain the effect of earth on vertical patterns?

OR

5) Derive expression for direction of pattern maxima and pattern minima of end fire array of n sources of equal amplitude and spacing?

UNIT - III

6) a) Draw and describe construction of Rhombic antenna and its radiation pattern? List out its advantages and disadvantages?

b) Write short notes on pyramical horn antennas?

OR

7) a) Draw and explain constructional details of helical antenna along with its radiation patterns?

b) List out advantages and disadvantages of slot antennas and microstrip antennas?

UNIT - IV

8) a) Explain about variation of field strength with height in space wave propagation?

b) Explain extended range propagation from tropospheric scattering.

OR

9) a) Explain the concept of Duct propagation in detail along with neat sketches.

b) Explain about earth constants that are related radio wave propagation.

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B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Fourth Year)

ELECTRONICS AND COMMUNICATION ENGG.

Paper – V : VLSI Design

Time : 3 Hours   Maximum Marks: 75

__Answer question No.1 is compulsory__   *(15)*

__Answer one question from each unit__   *(4×15 = 60)*

1)   a)   State Moore's Law in VLSI circuits.

    b)   Define inverter delays and propagation delays.

    c)   What is meant by scaling factor.

    d)   Draw the circuit of NAND gate using CMOS logic.

    e)   Expand PLD, PLA, FPGA, ASIC and HDL.

    f)   What are the constants used in VHDL.

    g)   List out the features of VHDL.

UNIT - I

2)   a)   Explain with neat sketches of CMOS fabrication using the n-well process.

    b)   What is meant by "latch – up"? Explain how latch up is invited and how it can be eliminated in CMOS circuits.

<p align="center">OR</p>

3)   a)   Mention the advantages of MOS technology over bipolar technology.

    b)   Draw CMOS inverter circuit with its stick diagram and explain its operation.

UNIT - II

4) a) Explain the following terms with respect to basic MOS circuit concepts.
   i) Sheet resistance
   ii) Area capacitance
   iii) Delay unit

   b) Explain about wiring capacitance.

<div align="center">OR</div>

5) a) Draw CMOS inverter circuit with its stick diagram and explain its operation.

   b) What are λ- based design rules? Give them for each layer.

UNIT - III

6) a) Explain the structural design of a parity generator.

   b) Explain the subsystem design approach of 4 –bit arithmetic processor as an example.

<div align="center">OR</div>

7) a) What are the various subsystem design principles and explain them with relevant diagrams?

   b) Explain the structural design of 4 : 1 multiplexer.

UNIT - IV

8) a) Differentiate between programmable logic devices and programmable logic arrays.

   b) Bring out the difference between dataflow design elements and behavioral design elements with an example.

<div align="center">OR</div>

9) a) Explain the following:
   i) Standard cell based ASICs
   ii) Gate array based ASICs

   b) Explain about Libraries and packages used in VHDL.

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(DEC 416 A)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Final Year)

ELECTRONICS & COMMUNICATIONS ENGG.

Paper - VI : Computer Networks

Time : 3 Hours   Maximum Marks: 75

Answer Question No.1 is compulsory   ***(15)***

Answer one question from each unit   ***(4×15 = 60)***

1) a) Differentiate IPV_4 vs IPV_6.

    b) Write about data link layer switching.

    c) Write about BG protocol.

    d) Write about RIP.

    e) Explain about key distribution in security & cryptographic algorithm.

UNIT - I

2) a) With a neat diagram explain the functionality of layers, protocols and   interfaces.

    b) Discuss about data link protocols.

                              OR

3) a) Explain about any four reasons for using layered protocols. Discuss about ISO/OSI reference model.

    b) Discuss about error connection and detection methods with examples.

UNIT - II

4) a) Explain five key assumptions in dynamic channel allocation in LANs and MANs.

    b) Discuss about Routing for Mobile Hosts.

<center>OR</center>

5)   a)   With an example explain Hierarchical Routing algorithms.

     b)   Discuss about collision five protocols.

UNIT - III

6)   a)   What are the different services provided by IP

     b)   What are the TCP implementations policy options.

<center>OR</center>

7)   a)   Explain OSPF packet format.

     b)   With required diagrams explain and differentiate between TCP and UPP?

UNIT - IV

8)   Discuss about

     a)   Public key encryption.

     b)   Digital signature

     c)   RSA algorithm

<center>OR</center>

9)   a)   What is the role of SMI in network management.

     b)   What is a key distribution centre? What is a certificate authority.

     c)   Discuss about authentication protocols.

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(DEC 416 B)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Final Year)

ELECTRONICS & COMMUNICATION ENGG.

Paper - VI : Speech Processing

Time : 3 Hours   **Maximum Marks: 75**

Question No.1 is compulsory   *(15)*

Answer one question from each unit   *(4×15 = 60)*

1) a) Define pitch period.

   b) What is meant by convolution.

   c) List the types of filter available for speech processing.

   d) Define sampling theorem.

   e) Why do we need step size.

   f) What is meant by modulation.

   g) Give the ranges of pitch in speech signal.

   h) Give categories of speech sounds.

UNIT - I

2) a) Write short notes on categorization of speech sounds.

   b) Explain distrete time model based on Tube concatenation.

OR

3) a) Write short notes on acoustics of speech production.

   b) Explain average zero crossing rate.

UNIT - II

4) a) Explain how signal estimation from STFT is done.

  b) Write short notes on DPCM.

<div align="center">OR</div>

5) a) Explain pitch estimation based on a comb filter.

  b) Write short notes on delta modulation.

UNIT - III

6) a) Write short notes on short-time homomorphic analysis.

  b) What is the significance of homomorphic filtering.

<div align="center">OR</div>

7) Explain short time speech analysis/synthesis structure.

UNIT - IV

8) Write explanatory notes on.

  a) Linear prediction

  b) Sub-band coding

<div align="center">OR</div>

9) a) Explain in detail lattice filter formulation.

  a) Write short notes on speaker recognition.

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B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Final Year)

ELECTRONICS AND COMMUNICATION ENGG.

Paper - VII : Radar and Navigational Aids

Time : 3 Hours   Maximum Marks: 75

Answer Question No.1 is compulsory   *(15)*

Answer ONE question from each unit   *(4×15 = 60)*

1)   a)   Explain about two kinds of system losses.

    b)   What is Max amplification range and express it.

    c)   Write down the aircraft navigation application of Radar.

    d)   What is minimum detectable signal.

    e)   Express surveillance radar range equation.

    f)   Explain staggered PRF.

    g)   Explain concept of Monostatic Radar.

    h)   Explain concept of Automatic data and tracking.

    i)   Mention the parameters that are meant to measure location of targets.

    j)   Express Radar eq^n interms of average power.

    k)   Define Doppler effect.

UNIT - I

2)   a)   Draw block diagram of pulse radar. Explain about each block.

    b)   Explain concept of receiver noise and signal to Noise Ratio.

OR

3) a) Draw & explain the block diagram of FMCW Radar? Explain about range and Doppler Measurement.

b) Derive simple form of radar equation.

UNIT - II

4) a) Explain MTI radar with power amplifier along with block diagram.

b) Explain concept of blind speeds.

OR

5) a) Explain in detail about conical scan along with block diagram.

b) Discuss filter characteristics of Delay line cancellers.

UNIT - III

6) a) Draw the block diagram of super heterodyne receiver? Explain in detail about each block.

b) Explain the concept of noise jamming.

OR

7) a) What is need of Duplexer in superheterodyne receiver? Explain about different type of duplexers.

b) Discuss about any two stealth applications.

UNIT - IV

8) a) Write down the salient features of   i)   LORAN   ii)   TACAN.

b) Explain about automatic direction finder.

OR

9) a) Explain principle of operation of VOR & DVOR.

b) Write down the Elementary ideas of Navigational Aids.

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B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Final Year)

ELECTRONICS AND COMMUNICATION ENGG.

Paper - VIII : Optical Communication

Time : 3 Hours   Maximum Marks: 75

Answer Question No.1 is compulsory   *(15)*

Answer ONE question from each unit   *(4×15 = 60)*

1) a)   Define critical angle.

    b)   Explain phenomena of splicing. Explain in brief about two categories of splicing.

    c)   Define Dispersion.

    d)   Determine the cut off wavelength for a step index fiber to exhibit single mode operation when the core refractive index and radius are 1.46 and 4.5 μm respectively, with the relative index difference being 0.25%?

    e)   Two single mode fibers with mode field diameters of 11.2 μm and 8.4 μm are to be connected together. Determine the loss at the connection due to the mode field diameter mismatch.

    f)   A ruby laser contains a crystal length 4 cm with a refractive index of 1.78. The peak emission wavelength from the device is 0.55 μm: Determine the number of longitudinal modes and their frequency separation.

    g)   Define bending losses in optical fiber.

    h)   Define step index fiber.

    i)   Mention the disadvantage of multimode fiber.

    j)   Define kerl nonlinearity.

2) a) Explain total internal reflexion in a perfect optical fiber with neat schematics.

b) A silica optical fiber with a core diameter large enough to be considered by ray theory analysis has a core refractive index of 1.50 and a cladding refractive index of 1.47. Determine:

i) Critical angle at core cladding interface.

ii) The NA for the fiber.

iii) The acceptance angle in the air for the fiber.

OR

3) a) Explain the propagation of skew rays in optic fiber. Obtain expression for NA for skewrays of optic fiber?

b) A multimode step index fiber with a core diameter of 80 μm and a relative index difference of 1.5% is operating at a wavelength of 0.85 μm. If the core refractive index is 1.48. Estimate:

i) The normalized frequency for the fiber.

ii) The number of guided model.

UNIT - II

4) a) Explain in detail about Intramodel dispersion in multimode step index fiber.

b) A multimode graded index fiber exhibits total pulse broadening of 0.1 μs over a distance of 15 km. Estimate:

i) The maximum possible BW on the link assuming no ISI.

ii) The pulse dispersion per unit length.

iii) The bandwidth length product for the fiber.

OR

5) a) Explain about material and absorption losses in silica glass fibers.

b) A single mode fiber has the following parameters:

normalized frequency = 2.40, core refractive index = 1.46

core diameter = 8 µm, numerical aperture = 0.1

Estimate the total insertion loss of a fiber joint with a lateral misalignment of 1 µm and an angular misalignment of 1°.

UNIT - III

6) a) Draw the schematic and explain super luminescent LED's.

b) An InGaAsP surface emitter has an activation energy of 1eV, with a constant of proportionality (β_0) of $1.84 \times 10^7 \ h^{-1}$. Estimate the CW operating life time for the LED with a constant temp. of 17°C, if it is assumed that the device is no longer useful when its optical output power has diminished to 0.67 of its original value?

OR

7) a) Explain output spectrum of LED with relevant plots.

b) Compare the electrical and optical bandwidths for an optical fiber communication system and develop a relationship between them.

UNIT - IV

8) a) Draw the block diagram of OTDM and explain in detail about each block.

b) Explain system considerations for optic fiber system.

OR

9) a) Explain the cutback technique in optic fiber system.

b) Draw any one LED drive circuit and explain its principle of operation.

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(DEC 423)

B.Tech. DEGREE EXAMINATION, DECEMBER – 2015

(Examination at the end of Final Year)

ELECTRONICS AND COMMUNICATION ENGG.

Paper - IX : Mobile and Cellular Communication (Waves)

Time : 3 Hours   Maximum Marks: 75

Answer Question No.1 is compulsory   **(15)**

Answer ONE question from each unit   **(4×15 = 60)**

1)   a)   What are the types of services?

   b)   What is a page?

   c)   Define blocked call delay system.

   d)   What is sectoring?

   e)   Define QPSK.

   f)   Define Digital modulation.

   g)   Define 'Bandwidth efficiency'.

   h)   What is the need of equalization?

UNIT - I

2)   a)   Explain frequency reuse concept.

   b)   Discuss the method of improving coverage and capacity in cellular system.

OR

3)   a)   Write short notes on cordless telephone systems.

   b)   Explain soft handoff and give its significance.

UNIT - II

4) a)   Explain reflection and Scattering. Discuss the impact on propagation of wave.

    b)   Explain Fading effects due to multipath time delay.

OR

5) a)   Derive an expression for link budget using path loss models.

    b)   Write short notes on Time diversity and Rake diversity.

UNIT - III

6) a)   Explain location tracking and cell set up.

    b)   Write briefly GSM-SMS-architecture.

OR

7) a)   Give a detailed explanation of mobile station.

    b)   Write the impact of Radio interface.

UNIT - IV

8)   Explain GPRS architecture and W-CDMA.

OR

9)   Write short notes on:

    a)   WAP model.

    b)   CDMA 2000.

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B.Tech. DEGREE EXAMINATION, DECEMBER. - 2015

(Examination at the end of Final Year)

ELECTRONICS AND COMMUNICATION ENGG

Paper - X : Digital Image Processing

Time : 03 Hours   **Maximum Marks : 75**

__Answer Question No.1 is compulsory__   **(15)**

__Answer One question from each unit__   **(4×15=60)**

1)   a)   How is digital image is represented.

     b)   What is a gray scale?

     c)   List where digital image processing is used.

     d)   Define sampling theorem.

     e)   What is variable length coding?

     f)   What is run length coding?

     g)   Define entropy.

     h)   What is thresholding?

UNIT –I

2)   a)   Explain in detail the elements of Digital image processing system.

     b)   Explain translation, scaling and rotation.

<div align="center">OR</div>

3)   a)   Explain the practical limitations in sampling and reconstruction.

     b)   Discuss the linear operations used in image processing.

UNIT –II

4) a) Explain properties of Fourier transform.

b) Explain the effect of high pass filters on an image.

OR

5) a) Explain high boost filtering.

b) Give the steps in histogram specification using a numerical example

UNIT –III

6) a) Explain the types in algebraic approach to restoration.

b) Explain the processing of inverse filtering.

OR

7) a) Explain Wiener filtering in detail.

b) Write short notes on position invariant degradations.

UNIT –IV

8) a) Explain edge detection using Laplacian operator

b) Discuss how boundary descriptors is done.

OR

9) a) Explain how detection of discontinuities is carried out.

b) Explain local thresholding.

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B.Tech. DEGREE EXAMINATION, DECEMBER - 2015

(Examination at the end of Final Year)

ELECTRONICS AND COMMUNICATION ENGG.

Paper - X : Microcontrollers and Embedded Systems

Time : 03 Hours   Maximum Marks : 75

Answer Question No.1 is compulsory   *(15)*

Answer One question from each unit   *(4×15=60)*

1) a) Write addressing modes of 8 bit micro controller.

    b) Purpose of CALL instruction , give an example.

    c) Differentiate parallel communication & serial communication.

    d) What is Kernel.

    e) Define smart card.

    f) Why security is required for OS.

    g) What are the problems in designing Embedded systems.

UNIT –I

2) a) Explain the importance of memory segmentation. Explain different segments in micro controllers.

    b)   What is a instruction and explain briefly about the instruction format of 8051 micro controller.

                              OR

3) a) Discuss about interrupt structure of 8051 micro controllers.

    b) Explain the terms:

i) Baud rate in the 8051.

ii) SCON register.

UNIT –II

4) a) Describe the various operating modes of the timer/counters and associated control registers.

b) Discuss serial I/O transmission using 8051.

OR

5) a) Write a program of 8051 to copy the value 55H into RAM memory location 40H to 45H using :

i) Direct Addressing mode.

ii) Register indirect addressing mode without a loop.

iii) With a loop.

b) How many ports are available in 8051? Out of them, which port pins are individually programmable.

c) What are the applications of micro controllers related to communications.

UNIT –III

6) Explain the functions of a scheduler in an RTOS and how does the scheduler carryout those functions.

OR

7) a) What are the key factors involved in selection of processor.

b) Discuss various problems involved in sharing data by multiple tasks. How these can be eliminated.

UNIT –IV

8) a) Discuss various methods adopted to reduce power consumption in embedded applications.

b) Explain the hardware-software co-design in an Embedded System.

OR

9) a) Describe real time programming issues during the software development process.

b) Describe the need of writing drivers for printers in Embedded System.

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