B.E. Sem-VIII – Elex.

Sub:- Advanced Networking Technologies.

**QP Code : 8082**

Time : 3 hours

Total marks : 100

Note: 1) Q1 is compulsory .Answer any four out of remaining six questions
2) All questions carry equal marks

Q.1 **Answer the following briefly: (any four)** (20)
(a) Compare TCP and UDP.
(b) Differentiate between OSI & TCP/IP Protocols.
(c) Explain fragmentation in IPv4.
(d) Explain ATM cell frame format.
(e) Describe CSMA/CA with a flow chart s implemented in WLAN.

Q.2(a) Explain IPv4 datagram format in detail. What are the strategies for transition from IPv4 to IPv6. (10)

(b) With a neat diagram, explain the frame format of Frame Relay . Explain how Congestion control and Quality of Service is implemented in it. (10)

Q.3(a) Compare Ubiquotous and hierarchical access in Access Network design. .Explain the steps for completing access layer design in detail. (10)

(b) Mention the need for network security. Explain different security threats and safeguards. (10)

Q.4(a) Which are the hardware components in SONET architecture? Draw the schematic diagram showing functional layers. Bring out the functions of each hardware component. (10)

(b) . Explain :(i) OAM &P
(ii) RMON (10)

Q.5(a) With a neat diagram, Explain ATM Protocol architecture , bringing out the functions of ATM layer and various AAL layers. (10)

(b) Explain DWDM technology in detail, with a neat schematic diagram of DWDM architecture., Bring out the advantages of Optical networking . (10)

Q.6(a) Explain 'Hidden station problem' in Wireless LAN? How is it tackled? With respect to IEEE 802.11 Protocol , explain the following: DCF, PCF , NAV vector, MAC sublayer (10)

(b) Explain : (i) DMZ (ii) Layer 7 filtering (10)

Q.7(a) Explain subnetting and supernetting with an example. (10)

(b) What is a firewall? What are the capabilities and limitations of firewall? Discuss the different types of firewalls, along with their advantages and disadvantages. (10)

**RJ-Con. 9878-15.**

B.E. (sem-VIII), Elex.

Sub:- Robbotics & Automation **QP Code : 8152**

**(3 Hours)** **[Total Marks : 100**

N.B.:
(1) Question No.1 is compulsory.
(2) Attempt any four questions out of remaining six questions.
(3) Assume suitable data wherever required.

Q.1. a) Define hard/fixed, soft/ flexible automation and hence the relative cost effectiveness of different types of automation with a neat sketch. [5]
b) How are robots classified? [5]
c) With neat sketch define the Joint and Link parameters [5]
d) Explain how parabolic blends eliminate infinite acceleration points on the trajectory of robots. [5]

Q2. a) Find the joint position of the tool tip of the Adept One robot when the joint variables are $q = [\Pi/4, -\Pi/3, 120, \Pi/2]^T$
Where $d = [877, 0.0, d3, 200]^T$, $a = [425, 375, 0.0, 0.0]^T$ [10]
b) Explain the basic steps involved in bounded deviation algorithm for straight line motion . [10]

Q.2. a) Explain the conditions for the existence of the Inverse Kinematics solutions and how are they simplified for the model robot with a spherical wrist . [5]
b) How do you find the inverse kinematics solutions based on the numerical and analytical approaches ? [5]
c) Explain Trajectory planning with examples. [10]

Q. 3. a) What are the considerations for applying DH algorithm? Explain the direct kinematic solution for a three link planar Robot. [10]
b) Explain noise in images. How are these classified? [10]

Q 4 a) Explain shrink and swell operators with examples. How are these applied? [10]
b) Name and explain with diagrams all the lower kinematic pairs. Indicate those that cannot be used in an actuated Robot joint and the reason for it. [10]

Q.5. a) What are the important edge detection methods for polygonal objects? Explain one of the edge detection technique? [10]
b) What are area descriptors? What are its advantages over line descriptors? Explain the different moments to characterizing shape? [10]

Q6 a) Explain the basic steps involved in bounded deviation algorithm for straight line motion . [10]
b) Draw & Explain the Ladder Diagram for controlling lubricating oil being dispensed from a tank [10]

Q 7. Write notes on the following [20]
(a) Robot specification (b) Template matching in Robot vision
(d) Task planner simulation (e) Link co-ordination arm equation

XXX

**RJ-Con. 10530-15.**

**Course:** B.E.(SEM VIII)(ELECTRONICS ENGG)(prog 758 TO 772)

**Q.P Code:** 8152

**Correction:**

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Please consider following correction for Question No 2

~~Q2. a) Find the joint position of the tool tip of the Adept One robot when the joint variables are q = [Π/4, Π/3, 120, Π/2]$^T$ Where d =[ 877, 0.0, d3, 200]$^T$, a =[425, 375, 0.0, 0.0]$^T$ [10]~~

~~b) Explain the basic steps involved in bounded deviation algorithm for straight line motion . [10]~~

Q.2. a) Explain the conditions for the existence of the Inverse Kinematics solutions and how are they simplified for the model robot with a spherical wrist [5]

b) How do you find the inverse kinematics solutions based on the numerical and analytical approaches ? [5]

c) Explain Trajectory planning with examples. [10]

Q 7. Write notes on the following [20]

(a) Robot specification (b) Template matching in Robot vision

(c) Task planner simulation (d)) Link co-ordination arm equation

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**Query Update time:** 26/05/2015 11:25 AM

Note: take printouts and distribute them to concerned students.

B.E. Sem VIII (Rev) Elex

ESRTP

1/6/2015

**QP Code : 8306**

(3 Hours) **[ Total Marks : 100**

**N.B. :** (1) Question No. 1 is compulsory.
(2) Answer any four of the remaining six questions.
(3) Draw neat diagram and assume suitable data wherever required.

1. (a) Explain low power modes of MSP430 with the help of clock modules. 5
   (b) What are the challenges in meeting various design metric/requirements. Explain for : 5
      (i) Low power
      (ii) High performance
   (c) Explain serial communication SCI & SPI, compare the same. 5
   (d) Compare various scheduling policies. 5

2. (a) Explain parallel peripherals of MSP430 10
   (b) Explain CAN features and protocols. 10

3. (a) Explain various modifiers and their purpose and use in an embeded system. 10
   (b) Compare assembly language programming with c-programming. 5
   (c) Compare ARM state with THUMB state. 5

4. (a) Explain interrupts/exceptions and its handling in ARM. 5
   (b) With the help of suitable diagram give difference between RS485 and RS232, also compare its characteristics, features. 10
   (c) Compare, explain various operating modes of ARM. 5

5. (a) In a real time system having periodic Tasks $T_1$, $T_2$, $T_3$ and aperiodic task $T_4$ all requesting at time t = 0 having following properties. 10

| Task | Period | Execution time | Deadline |
|---|---|---|---|
| $T_1$ | 210 | 70 | 210 |
| $T_2$ | 70 | 21 | 70 |
| $T_3$ | 140 | 28 | 140 |
| $T_4$ | aperiodic | 80 | 420 |

**[TURN OVER**

**RJ-Con. 11443-15.**

(i) Calculate utilisation ratios and hence comment on scheduling.
(ii) Graphically illustrate the scheduling scheme
(iii) Determine if the tasks can meet deadlines.

5. (b) Explain and compare priority inversion problems and suggest solution to convert unbounded priority inversion to bounded priority inversion. 10

6. Design an access control system using finger scan. Stored finger scan database is on remote server. the system should control access: by raising alarm on multiple failure and opening door on successful match. For the above design. 20
   (a) Develop and draw functional model using FSM.
   (b) Develop and draw block diagram representing hardware modules / blocks.
   (c) Suggest list of components with proper justification for the selection (from several options available)

7. Write short notes on any three : 20
   (a) Black box and white box testing
   (b) Comparision between ASIC and SoC
   (c) Preprocessor directives
   (d) Preemptive and non pre-emptive scheduling comparison.

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