

Code : 13CE4201

B.TECH. DEGREE EXAMINATION, APRIL 2017

IV B.Tech II Semester

DESIGN AND DRAWING OF IRRIGATION STRUCTURES
(Civil Engineering)

Time : 3 hours

Max Marks: 60

Answer any ONE question
All questions carry equal marks

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Assume suitable data wherever required.

Use of Garret's diagrams, Khosla's charts, Lacey's charts permitted.

1 Design a surplus weir for an irrigation tank which has the following data.

Combined catchment area : 26 km²
 Intercepted catchment area : 20.5 km²
 Top width of the tank bund : 2.0 m
 Side slopes of the tank bund : 2H: 1V
 TBL : +14.50
 MWL : 12.75
 FTL : +12.00
 Average ground level at the site of work : +11.00
 Coefficient in Ryve's formula : 7.5 (combined)
 Coefficient in Ryve's formula : 2.5 (intercepted)
 Hard soil is available for foundations at +9.50

Draw Half plan at top level and half at the foundation level. Also draw the cross sections of abutment, wing walls and return walls.

2 Design and draw a cross drainage work to suit the following hydraulic particulars.

Canal:

Full supply discharge : 35 cumecs
 Bed width : 20 m
 Bed level : +40.00
 FSL : + 42.00
 Ultimate bed level : +39.75
 Ultimate full supply level : +42.50
 Average velocity in the canal : 0.83 m/s
 Left bank top width : 5.0 m
 Right bank top width : 2.0 m
 Canal side slopes: both inside and outside are 2:1 in embankment with a minimum cover of one meter over the hydraulic gradient.
 Top of canal bank : +43.50
 Average ground level on flanks of drain: +38.00 and the bed level of the drain may also be taken as +38.00 at the point of crossing.

Drain:

Catchment area : 8.0 km².

The max. computed discharge is worked out at 60 cumecs using a coefficient of C = 15 in Ryve's formula.

Max. flood level of the drain at the site of crossing is +39.75 (observed)

Average bed level of the drain at the site of crossing is +38.00.

Hard soil suitable for the foundation is met at +37.00

B.TECH. DEGREE EXAMINATION, APRIL 2017
IV B.Tech. II Semester

ENVIRONMENTAL STUDIES
(Civil Engineering)

Time: 3 hours

Max. Marks: 60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks

SECTION – I

1. (a) Name different types of biotic components of the environment. Mention their specific roles in nature.
- (b) Briefly describe the need of public awareness about the environment.

OR

2. (a) What are the different trophic levels of organisms in an ecosystem?
- (b) Why is a complex ecosystem more stable than one with few species?

SECTION – II

3. (a) Explain the major water pollutants and their effects.
- (b) Explain the significance of dissolved oxygen in rivers.

OR

4. (a) Explain the value of minerals as natural resources.
- (b) Describe the role of individual in conservation of natural resources.

SECTION – III

5. (a) What is acid rain? What are the causes and effects of acid rain?
- (b) How can the formation of acid rain be avoided?

OR

6. (a) What are the control measures used for controlling soil pollution?
- (b) What is noise? Describe briefly the effects of noise on human health.

SECTION - IV

7. (a) Define watershed management and explain its objectives.
- (b) Discuss various water conservation techniques that can be practiced by individuals.

OR

8. What are greenhouse gases and greenhouse effect? Discuss the potential and contribution of these gases to global warming phenomenon.

SECTION – V

9. Discuss briefly the provision of the following Acts:

- (a) The Water (Prevention Control of Pollution) Act, 1974
- (b) The Air (Prevention and Control of Pollution) Act, 1981
- (c) The Wildlife Protection Act 1971
- (d) The Forest Conservation Act of 1980

OR

10. Explain the causes and effects of air pollution by describing any urban or industrial area that you have studied.

Code :13EE4217

B.TECH. DEGREE EXAMINATION, APRIL 2017

IV B.Tech. II Semester

HIGH VOLTAGE ENGINEERING
(Electrical & Electronics Engineering)

Time : 3 hours

Max. Marks :60

*Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks*

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SECTION - I

- 1 a) Explain with neat sketch Cockroft-Walton voltage multiplier circuit.
b) Derive the expression for voltage efficiency of a single stage impulse generator.
- 2 a) Explain clearly the basic principle of operation of an electrostatic generator and give the applications and limitations of Van de Graaf generator.
b) Draw and compare the two simplified equivalent circuits of the impulse generator.

SECTION - II

- 3 a) Draw Chudd-Fortescue circuit for measurement of peak value of AC voltage. Discuss its advantages over other methods.
b) What are the problems associated with measurement of very high impulse voltage.
- 4 a) Discuss various methods of measuring high impulse currents.
b) Explain the principle of operation of electrostatic voltmeter and Discuss its advantages and limitations.

SECTION - III

- 5 a) Explain the procedure for testing of string insulator.
b) List out various tests to be carried out on insulators and give a brief account of each test.
- 6 a) Explain the procedure for performing stability test and partial discharge test.
b) Describe various tests to be carried out on circuit breaker.

SECTION - IV

- 7 a) What is non-destructive testing of insulating materials? Give the characteristics of these methods.
b) Explain inverted Schering bridge? Give its applications.
- 8 a) What are partial discharges? Differentiate between internal and external discharges.
b) Develop an equivalent circuit of insulating material during partial discharge.

SECTION - V

- 9 a) Discuss various factors which affect breakdown of gases.
b) Define Townsend's first and second ionization coefficients. Explain Townsend's criterion for a spark.
- 10 a) Compare various theories of breakdown in liquid dielectrics.
b) Explain thermal breakdown in solids.

B.TECH. DEGREE EXAMINATION, APRIL 2017

IV B.Tech. II Semester

POWER SYSTEM OPERATION & CONTROL

(Electrical & Electronics Engineering)

Time: 3 hours

Max. Marks: 60

*Answer FIVE Questions; Choosing ONE Question from each section**All Questions carry equal marks***SECTION - I**

- 1 a Develop the condition of economic operation of a power system with 'n' plants when losses are neglected.
- b Evaluate the real power generations, total demand and the transmission power loss from the following data:
The incremental fuel cost for two plants are
 $dC_1 / dP_{G1} = 0.075 P_{G1} + 18 \text{ Rs./MWh}$
 $dC_2 / dP_{G2} = 0.08 P_{G2} + 16 \text{ Rs./MWh}$
The loss coefficients are given as
 $B_{11} = 0.0015 / \text{MW}$, $B_{12} = -0.0004 / \text{MW}$ and $B_{22} = 0.0032 / \text{MW}$ for $\lambda = 25 \text{ Rs./MWh}$.
- 2 a Discuss the λ -iterative technique used to solve economic load dispatch problem.
- b A system consisting of two generating plants with fuel costs of
 $C_1 = 0.05P_{G1}^2 + 20P_{G1} + 1.5$
 $C_2 = 0.075P_{G2}^2 + 22.5P_{G2} + 1.6$
The system is operating on economical dispatch with 100 MW of power generation by each plant. The incremental loss of plant-2 is 0.2. Determine the penalty factor of plant-1.

SECTION - II

- 3 Solve analytically the short term hydro thermal scheduling problem with and without loss.
- 4 Define unit commitment problem and discuss its solution by using priority list scheme method in power system.

SECTION - III

- 5 Write short notes on modeling of exciter and generator.

- 6 Explain the reasons for variation of voltages in power systems & discuss any two methods of reactive power control.

SECTION - IV

- 7 a Explain why the frequency is to be maintained as constant in the power system?
- b Two synchronous generators operate in parallel and supply a total load of 400 MW. The capacities of machines are 200 MW and 500 MW and both have frequency droop characteristics of 4% from no load to full load. Determine the load taken each machine assuming free governor operation and also find the system frequency at this load.
- 8 Develop the expression for steady state frequency and tie line power in case of two identical areas connected by a tie-line.

SECTION - V

- 9 Categorize and explain about main tasks in power system operation.
- 10 a Discuss about energy management system.
- b Define state estimation and how it is used in power system.

IV Year II Semester

DIGITAL IMAGE PROCESSING

(Electronics & Communication Engineering)

Time: 3 hours

Max. Marks: 60

*Answer any FIVE questions, Choosing ONE Question from each section**All questions carry equal marks*

SECTION – I

1. (a) What are the different types of image sensors?
(b) Explain about fundamental steps in digital image processing system.
2. (a) Discuss in detail about sampling and quantization of images.
(b) Explain the terms adjacency, regions and boundaries in images.

SECTION – II

3. Define DFT and explain any four properties.
4. Explain
 - (i) Hadamard Transform
 - (ii) Haar Transform
 - (iii) KL Transform

SECTION – III

5. (a) Define histogram of an image.
(b) Explain about various spatial filters for image smoothing and sharpening methods.
6. (a) Explain the conversion from HSI to RGB colour model.
(b) Discuss about full colour image processing.

SECTION – IV

7. (a) Explain degradation model in detail.
(b) Explain about least mean square filters.
8. (a) What is meant by image segmentation? Explain.
(b) Write short notes on Edge linking and thresholding techniques.

SECTION – V

9. (a) Explain about fidelity criterion.
(b) Explain Huffman coding technique with an example.
10. (a) Explain different types of image compression models.
(b) Write short notes on Lossless image compression method.

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B.TECH. DEGREE EXAMINATION, APRIL 2017

IV B.Tech. II Semester

**SATELLITE COMMUNICATION
(Electronics & Communication Engineering)**

Time : 3 hours

Max. Marks :60

*Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks*

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SECTION - I

- 1 a) What is the need of satellite communication in the modern world?
b) What are the basic concepts of satellite communication?
- 2 a) How Azimuth look angle can be determined?
b) Describe the steps involved in launching a satellite.

SECTION - II

- 3 a) How different satellites can be monitored by us in space?
b) What are various communication subsystems used in satellite communication?
- 4 a) Explain what is meant by the G/T ratio of a satellite receiving system.
b) How the downlink of any satellite communication system can be designed?

SECTION - III

- 5 a) Describe the general operating principles of a time division multiple access network.
b) Explain the need for a reference burst in a TDMA system.
- 6 a) What are the tracking techniques used in satellite communication?
b) Explain briefly antenna tracking systems.

SECTION - IV

- 7 a) What are the disadvantages of Geo-synchronous satellites?
b) Sketch the ground trace of an almost geo-stationary satellite and briefly explain what parameters decide its shapes.
- 8 a) Explain about GPS signal levels in detail.
b) Explain about GPS receivers and coders.

SECTION - V

- 9 a) What are the advantages of geosynchronous satellites?
b) Describe different earth station antennas.
- 10 What are the different earth station considerations?

B.TECH. DEGREE EXAMINATION, APRIL 2017

IV B.Tech II Semester

AUTOMOBILE ENGINEERING
(Mechanical Engineering)

Time : 3 hours

Max Marks : 60

Answer FIVE Questions, Choosing ONE Question from each section

All questions carry equal marks

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SECTION - I

- 1 (a) What are the main components of an automobile? Explain how the power from the engine to the wheels is transmitted?
- 2 (a) Name the different types of combustion chambers of CI Engine? With the help of neat sketch explain pre combustion chamber of diesel engine.
(b) What is supercharging? Explain its benefits.

SECTION - II

- 3 Draw a neat diagram of fuel feed system used in a car showing the positions of different Parts. With a neat sketch explain electrical fuel pump.
- 4 What is meant by Compensation devices in the carburetor? Explain different types of Compensation devices.

SECTION - III

- 5 (a) Discuss the merits and demerits of water cooling system with air cooling system.
(b) What are the functions of lubrication system for an Engine? Name different types of lubrication systems used for heavy vehicles. Explain any one of them.
- 6 (a) Discuss the relative merits and demerits of electronic ignition system over conventional ignition system.
(b) How do rating of batteries is done? With neat sketch explain about voltage & current regulator.

SECTION - IV

- 7 (a) With the help of neat sketch, explain the working of torque converter. What are its major advantages over fluid coupling?
(b) Name different types of Transmission systems used in an automobile? With a neat sketch explain constant mesh gearbox with four forward and one reverse gear.
- 8 (a) Why a differential is needed for an automobile? With a neat sketch explain how the differential works.
(b) Draw a neat diagram of propeller shaft showing its joining to the gear box shaft and differential.

SECTION - V

- 9 Why wheel alignment is required? Briefly explain caster angles, camber angles, toe-in, toe-out.
- 10 Explain the working of vacuum brake system with simple diagram. Discuss its advantages and disadvantages with hydraulic brake system.

FINITE ELEMENTS METHOD
(Mechanical Engineering)

Time : 3 hours

Max Marks : 60

Answer FIVE Questions, Choosing ONE Question from each section

All questions carry equal marks

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SECTION-I

- 1 (a) Explain the step by step procedure about finite element modeling.
- (b) Write short notes on structural and non-structural analysis.
2. (a) Find the solution of a boundary value problem $y'' + 4y = 0$ with $y(\pi/8) = 0$ and $y(\pi/6) = 1$.
- (b) List the various engineering application of finite element methods.

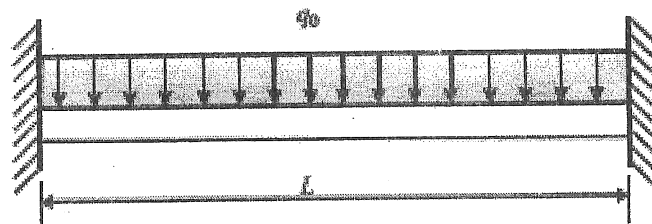
SECTION-II

- 3 The following differential equation is available for a physical phenomenon, $d^2y/dx^2 - 10x^2 = 5$, $0 \leq x \leq 1$ with boundary conditions as $y(0) = 0$ and $y(1) = 0$. Find an approximate solution of the above differential equation by using Galerkin's method of weighted residuals and also compare with exact solution.
- 4 (a) Solve the following by use weak formulation.

$$EJ \frac{d^4 v}{dx^4} - q_0 = 0$$

$$v(0) = 0, \quad \frac{dv}{dx}(0) = 0$$

$$v(L) = 0, \quad \frac{dv}{dx}(L) = 0$$

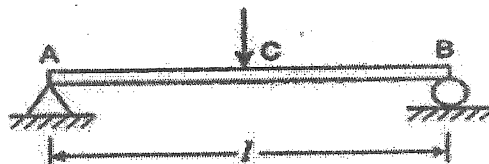


Fixed-fixed beam.

- (b) Write the concept of piece-wise continuous trial function.

SECTION-III

- 5 (a) A beam AB of span 'l' simply supported at the ends and carrying a concentrated load 'W' at the centre 'C' as shown in figure. Determine the deflection at the mid span by using Rayleigh-Ritz method.

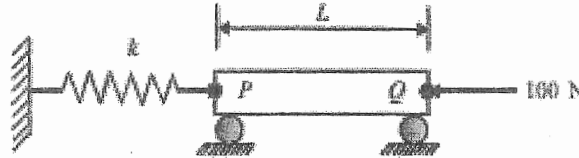


- (b) Obtain finite element equation for a bar using the PSTP.

- 6 (a) Derive the temperature function and shape function for one dimensional heat conduction element.
 (b) Obtain the heat transfer equation for one dimensional heat conduction element.

SECTION-IV

- 7 Consider a spring mounted bar as shown in the figure. Solve the displacements points P and Q using bar elements (assume $AE = \text{const}$)



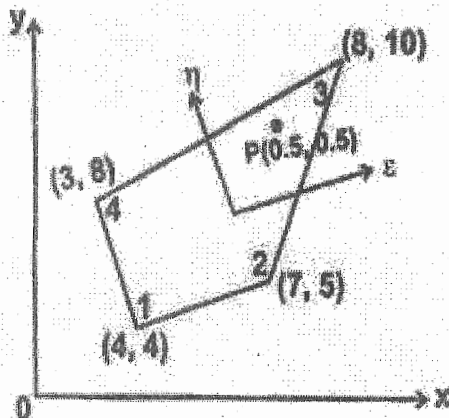
- 8 Develop the shape function and stiffness matrix for one dimensional quadratic bar element.

SECTION-V

- 9 (a) Derive the stress-strain relationship matrix for two dimensional constant strain triangle elements and obtain the relations for plane stress and plane strain?
 (b) Obtain shape functions for 4node quadrilateral element in natural coordinate system. Follow serendipity approach.
- 10 (a) Evaluate the integral by using Gaussian quadrature and obtain the percentage of error. $\int_{-1}^{+1} (2 + x + x^2) dx$ Note: data provided.

n	Location X	Weight W
1	0	2
2	$\frac{1}{\sqrt{3}}, -\frac{1}{\sqrt{3}}$	1, 1

- (b) Evaluate the Jacobian matrix at the local coordinates $\xi = \eta = 0.5$ for the linear quadrilateral element with its global coordinates as shown in fig. Also evaluate the strain-displacement matrix.



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B.TECH. DEGREE EXAMINATION, APRIL 2017

IV B.Tech. II Semester

CLOUD COMPUTING
(Computer Science & Engineering)

Time : 3 hours

Max. Marks :60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks

* * *

SECTION - I

- 1 (a) Discuss six key properties of cloud computing from Google's perspective.
(b) Illustrate with a neat diagram the architecture behind a cloud computing system.
- 2 (a) Examine the pros and cons of cloud computing.
(b) Identify the users who shouldn't use cloud computing? Give reasons.

SECTION - II

- 3 Outline the different ways a company can use cloud computing to develop its own business applications.
- 4 (a) Mention the pros and cons of cloud service development.
(b) Discuss how Amazon and Google are contributing to cloud services development?

SECTION - III

- 5 Discuss the different ways how a family can communicate and collaborate using cloud computing?
- 6 (a) Explain how a community can collaborate on schedules?
(b) Examine how a corporation uses cloud computing to collaborate on their financial statements?

SECTION - IV

- 7 (a) With the help of a neat sketch, explain any one online scheduling application.
(b) Explain how To-Do lists are useful for online planning and Task Management?
- 8 How does web based processing work?

SECTION - V

- 9 Discuss various ways of collaborating via web based communication tools.
- 10 Discuss various ways of collaborating via blogs and wikis.

B.TECH. DEGREE EXAMINATION, APRIL 2017

IV B.Tech. II Semester

**STORAGE AREA NETWORKS
(Computer Science & Engineering)**

Time : 3 hours

Max. Marks : 60

*Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks*

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SECTION - I

- 1 What is SAN? Justify why we need to connect storages into a network.
- 2 Explain in detail about the SAN Paradigm Shift.

SECTION - II

- 3 Explain the view of Data Center Evolution.
- 4 Write in Detail about Disaster Recoverability.

SECTION - III

- 5 What are the different paths from data to applications?
- 6 Explain about Network Storage Systems.

SECTION - IV

- 7 What are the different Shared Access Managers?
- 8 Explain in detail about Advanced Software for Storage Networking?

SECTION - V

- 9 Explain the a) Data Center Clusters b) Applications and Clusters
- 10 Write about the Backup Management for Storage Area Networks.

IV B.Tech II Semester

**REMOTE SENSING & GIS
(Civil Engineering)**

Time: 3 hours

Max. Marks: 60

*Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks*

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SECTION - I

- 1 (a) Define Remote Sensing. Explain the process of remote sensing with a neat sketch.
(b) Discuss Planck's law and Stefan Boltzmann's law in detail.
- 2 (a) Explain electromagnetic spectrum in detail.
(b) Define spectral signature. Discuss spectral signature of vegetation along with a neat sketch.

SECTION - II

- 3 (a) What is a platform? Explain various types of platforms in detail.
(b) Discuss the characteristics of Cartosat and INSAT satellites.
- 4 (a) Differentiate push broom and whisk broom scanners along with a neat sketch.
(b) Define (i) IFOV (ii) Revisit period (iii) Swath width

SECTION - III

- 5 (a) Explain various types of data products in detail.
(b) Explain the keys of image interpretation.
- 6 (a) Define (i) Image interpretation (ii) Detection
(b) Explain the elements of image interpretation.

SECTION - IV

- 7 Define classification. Explain supervised and unsupervised classification.
- 8 (a) Define (i) Rectification (ii) Edge enhancement
(b) Differentiate radiometric and geometric correction. Briefly explain the necessity of performing corrections to satellite images.

SECTION - V

- 9 (a) Define GIS. Discuss the components of GIS.
(b) Discuss (i) Data input (ii) Data management (iii) Data retrieval.
- 10 Explain raster and vector data structures in detail.

Code : 13EE42E1

B.TECH. DEGREE EXAMINATION, APRIL 2017

IV B.Tech. II Semester

**HVDC TRANSMISSION
(Electrical & Electronics Engineering)**

Time : 3 hours

Max. Marks :60

*Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks*

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SECTION - I

- 1 A List out the advantages and disadvantages of HVDC transmission.
B Compare AC & DC transmission systems?
- 2 A What are the types of HVDC links? Explain them with figures.
B Draw the schematic diagram of a typical HVDC converter station.

SECTION - II

- 3 A What is meant by pulse number, extinction angle delay angle and commutation margin angle? Explain
B Explain the analysis of Graetz circuit with also derive the output voltage equation.
- 4 A Explain the converter bridge characteristics when operating as rectifier.
B Explain the factors for choosing the best converter configuration.

SECTION - III

- 5 Explain the following control of HVDC converters.
A) Constant current control B) Equidistant firing angle control
- 6 A Explain in detail principle of DC link control.
B Explain the process of starting and stopping a dc link.

SECTION - IV

- 7 A What are the causes of over current in converter station? How do you Protect.
B Write short notes on DC reactors.
- 8 A What are the causes of over voltage in converter station? How do you Protect.
B Write short notes on DC circuit breakers.

SECTION - V

- 9 A Explain the reactive power requirements of the converter and how they are affected by Converter control methods
- B Explain in detail operation of Static VAR
- 10 A Derive an equation for harmonic voltage and current for single tuned filter.
- B What are the filter configurations that are employed for HVDC converter station?

Code :13EC42E3

B.TECH. DEGREE EXAMINATION, APRIL 2017

IV B.Tech. II Semester

CELLULAR MOBILE COMMUNICATION
(Electronics & Communication Engineering)

Time : 3 hours

Max. Marks :60

Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks

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SECTION - I

- 1 a What are the limitations of conventional mobile systems and how are they overcome by cellular mobile systems?
b What is the need for splitting? Explain cell splitting.
c Why the hexagonal is preferred for cell shape?
- 2 a Derive the C/I for normal case in an Omni directional antenna system.
b What is near-end-far-end interference ratio? Explain its effects.

SECTION - II

- 3 a Briefly explain the factors considered for prediction of path loss for a particular mobile radio environment.
b Briefly explain the effect of foliage loss in mobile signal propagation.
- 4 a Explain the general formula of received power from real model based on shadow case, direct path & over the water condition in detail.
b Explain the effects of cell site antenna height on cell coverage.

SECTION - III

- 5 a Define co-channel interference. How is it measured at the mobile unit and cell site?
b Write a brief note on designing directional antenna system considering the effect of interference.
- 6 a What is tilting antenna? How can these antenna patterns reduce the co-channel interference?
b Explain space-diversity antennas used at cell site.

SECTION - IV

- 7 a What are the factors influencing Handoffs?
b What are the reasons for perception of dropped call rate by the subscribers can be higher?
- 8 a Explain how the frequency management increases spectrum efficiency?
b Draw a short term traffic relief scheme used for a seven-cell three face system and explain it.

SECTION - V

- 9 a What are the services offered by GSM channels? Explain it.
b With necessary diagrams explain the features of TDMA and CDMA. Compare their performance in the context of mobile environment.
- 10 a Draw the external environment of the BSS and explain its functioning in GSM.
b Draw and explain NA-TDMA system architecture.

B.TECH. DEGREE EXAMINATION, APRIL 2017

IV B.Tech II Semester**AUTOMATION & ROBOTICS****(Mechanical Engineering)**

Time: 3 hours

Max. Marks: 60

*Answer FIVE Questions, Choosing ONE Question from each section
All Questions carry equal marks*

* * *

SECTION - I

- 1 Describe the importance of automation strategies in manufacturing process?
- 2 Explain single station automated assembly system components with neat sketch?

SECTION - II

- 3 Write a short note on automated flow line systems and their types?
- 4 Solve the following problem with Largest Candidate Rule?

Work Element	T_{ej}	Must be Preceded by
1	0.2	-
2	0.4	-
3	0.7	1
4	0.1	1,2
5	0.3	2
6	0.11	3
7	0.32	3
8	0.6	3,4
9	0.27	6,7,8
10	0.38	5,8
11	0.5	9,10
12	0.12	11

SECTION - III

- 5 Define the term ROBOT? Explain the robot anatomy with a neat sketch?
- 6 Classify actuators? Explain the function of stepper motor with neat sketch?

SECTION - IV

Justify the importance of sensors in robots? Write a short note on proximity sensors?

Derive the forward and reverse kinematic equations for 2 DOF robot ?

SECTION - V

It is desired to have the first joint of a six axis robot go from initial angle of 30° to a final angle of 75° in 5 seconds. Using a third order polynomial, calculate the joint angle at 1,2,3 and 4 seconds?

Describe briefly the following applications of robots :

- a) Machine loading and unloading operations.
- b) Spray painting.

B.TECH. DEGREE EXAMINATION, APRIL 2017

IV B.Tech. II Semester

MULTIMEDIA APPLICATION DEVELOPMENT

(Computer Science & Engineering)

Time : 3 hours

Max. Marks :60

Answer FIVE Questions, Choosing ONE Question from each section.

All Questions carry equal marks

SECTION - I

- 1 For non-ordered dithering, a standard graphics text states, "Even larger patterns can be used, but the spatial versus intensity resolution trade-off is limited by our visual acuity (about one minute of arc in normal lighting)."
(a) What does this sentence mean?
(b) If we hold a piece of paper out at a distance of 1 foot, what is the approximate linear distance between dots? (Information: One minute of arc is 1/60 of one degree of angle. Arc length on a circle equals angle (in radians) times radius.) Could we see the gap between dots on a 300 dpi printer?
(c) Write down an algorithm (pseudo code) for calculating a color histogram for RGB data.
- 2 If the signals for television are combined into a fewer than all the parts required for TV transmission, then find the following:
(i) Altogether, how many and what are the signals used for studio broadcast TV?
(ii) How many and what signals are used in S-video? Briefly explain S-video?
(iii) How many signals are actually broadcast for standard analog TV reception and What kind of video that is observed?

SECTION - II

- 3 Briefly Explain the Following:
 - i) Handling an Unknown Number of Parameters
 - ii) Overriding Instance Methods
 - iii) Preventing Classes from Being Extended and Methods from Being Overridden
 - iv) Data types and Type Annotations
- 4 Explain the importance of the concept of inheritance in action script with an example?

SECTION - III

- 5 Describe OOP Application framework?
- 6 Explain the dictionary-based LZW compression algorithm. Suppose the alphabet is the set of symbols {0, 1}. Show the dictionary (symbol sets plus associated codes) and output for LZW compression of the input.

0 1 1 0 0 1 1

SECTION - IV

- 7 Write the procedure for 2D Logarithmic Search for motion vectors and explain it with a neat diagram.
- 8 Write a program to add fade in and fade out effects to sound clips (in WAV format). Specifications for the fades are as follows: The algorithm assumes a linear envelope; the fade-in duration is from 0% to 20% of the data samples; the fade-out duration is from 80% to 100% of the data samples. Further, make sure that your code is able to handle both mono and stereo WAV files. If necessary, impose a limit on the size of the input file, say 16 megabytes.

SECTION - V

- 9 Figure 1 shows the RSVP Protocol. In (d), receiver R3 decides to send an RSVP RESV message to S1. Assuming that Figure 1 specifies the complete state of the network, then check whether the path reserved for maximizing the future network throughput is optimal or not? Without modifying the RSVP protocol, suggest a scheme in which such a path will be discovered and chosen by the network nodes.

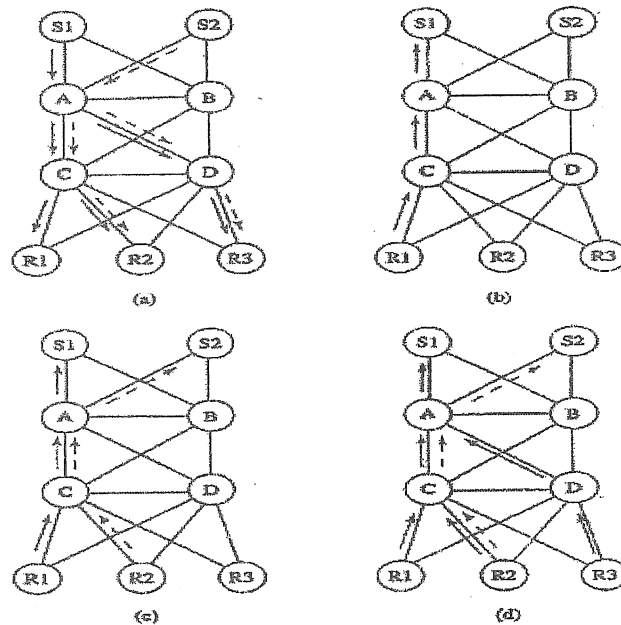


Figure 1: Illustration of RSVP Protocol

- 10 Explain the general architecture of Set-top Box with a neat diagram.