

AR18

CODE: 18CET317

SET-2

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

III B.Tech II Semester Regular Examinations, Sep/Oct-2021

**BASIC DESIGN OF STEEL STRUCTURES
(Civil Engineering)**

Time: 3 Hours

Max Marks: 60

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

1. Estimate strength and efficiency of a single bolted double cover butt joint is used to connect two plates of 10 mm thick. Provide 20 mm diameter bolts of grade 4.6 are used and cover plates are 8 mm thick. Assume pitch of 50 mm and edge distance 30 mm. 12M

(OR)

2. A tie member consists of two ISMC 250. The channels are connected on either side of a 12 mm thick gusset plate. Design the welded joint to develop the full strength of the tie. However, the overlap is to be limited to 400 mm. 12M

UNIT-II

3. An ISMB 500 section is used as a beam over a span of 6 m, with simply supported ends. Determine the bending strength and maximum factored uniformly distributed load that the beam can carry if the ends are restrained against torsion but compression flange is laterally supported. 12M

(OR)

4. A simply supported beam of span 5 m supports a reinforced concrete slab floor capable of providing lateral restraint to the top compression flange. The loads supported by the beam comprise of a uniformly distributed service live load of 15 kN/m and the dead load due to the floor slab and other fittings of 15 kN/m. Adopting Fe 410 grade steel, design the simply supported steel beam according to IS: 800: 2007. 12M

UNIT-III

5. Determine the design axial load capacity of the column ISHB 300 @ 577 N/m if the length of the column is 3 m and its both ends are pinned (hinged). 12M

(OR)

6. Design a batten column with two channels back to back of length 10 m to carry an axial factored load of 1400 kN. The column may be assumed to have restrained in position but not in direction at both ends (hinged ends). 12M

UNIT-IV

7. Design a simply supported gantry girder to support a manually overhead travelling crane having a capacity of 100 kN using the following data: 12M
Weight of crane excluding trolley: 50 kN
Weight of trolley :25 kN
Distance between centres of gantry rails: 16m
Minimum approach of crane hook: 1.2 m
Distance between centres of crane wheels: 3.5 m
Span of gantry girder: 8 m
Weight of rail section: 0.3 kN/m
Height of rail section: 75 mm
Yield stress of steel: 250 MPa.
Draw the cross section of the gantry girder to a suitable scale.
(OR)
8. Design a simply supported gantry girder to carry an electric overhead travelling crane for the following data: 12M
Span of gantry girder: 6.5 m
Span of crane girder: 16 m
Crane capacity: 250 kN
Self weight of crane girder excluding trolley: 200 kN
Self weight of trolley: 50 kN
Minimum hook approach: 1.0 m
Self weight of rails: 0.3 kN/m

UNIT-V

9. Write a short note on the following: (i) Web (ii) Flanges 12M
(iii) Stiffeners (iv) Size of flanges.
Detail the elements of plate girder with neat sketches.
- (OR)**
10. Design a simply supported plate girder of span 15 m carrying a factored UDL of 48 kN/m. Avoid use of bearing and intermediate stiffeners. Use Fe 415. 12M

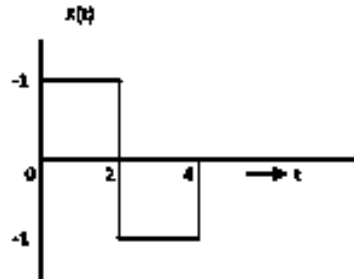
Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

1. a)



6

Find and sketch the following signals:

i) $X(2t-4)$

ii) $X(-2t+4)$

iii) $X(t/2)$

b)

Identify whether the following systems are static, causal, and dynamic

6

a) $y(t) = x(\sin t)$

b) $y(t) = \frac{t}{1+x^2(t)}$

(OR)

2. a) Identify whether the following signals are periodic. If periodic, find the fundamental period.

6

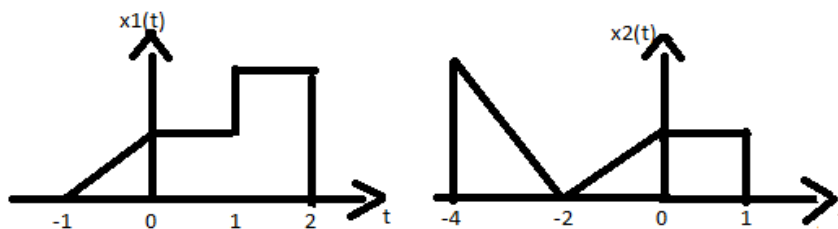
i) $X(t) = 2\cos(10t+1) - \sin(4t-1)$

ii) $X(t) = 1 + e^{j4\pi t/7} - e^{j2\pi t/5}$

iii) $X(t) = 2\sin 4\pi t u(t)$

b) Sketch the signals $x_1(2t+1)$ and $x_2(-3t+5)$ for the given signals $x_1(t)$ and $x_2(t)$?

6

UNIT-II

3. a) Describe the Properties of Convolution.

6

b) The impulse response of a discrete-time LTI system is given by:

6

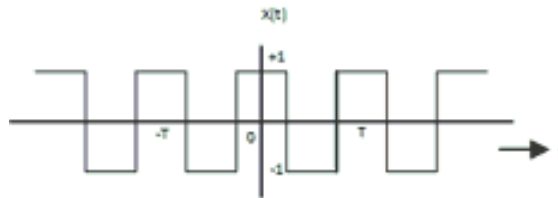
 $h[n] = (1/2)^n u[n]$ and the input $x[n] = 2\delta[n] + \delta[n-3]$. Find the outputs $y[1]$ and $y[4]$.

(OR)

4. a) Explain different types of systems. 6
 b) Find the convolution of the following signals: 6
 $x(t) = u(t-3) - u(t-5)$, $h(t) = e^{-3t} u(t)$

UNIT-III

5. a) Discuss the following properties of continuous time fourier series: 6
 i) Differentiation in time domain
 ii) Time shifting
 b) Find the fourier series of the signal $x(t)$. 6



(OR)

- 6 State and prove any four properties of fourier transform: 12

UNIT-IV

7. a) Find the laplace transform of the following signals and identify the region of convergence: 6
 i) $x(t) = t \cos \omega_0 t u(t)$
 ii) $x(t) = \frac{d}{dt}(e^{-3(t-2)} u(t-2))$
 b) Find the initial value and final values of $x(t)$, if $x(s) = \frac{10(3s+3)}{s^2(s^2+2s+5)}$ 6

(OR)

8. a) Find the impulse response of the system: 6
 $\frac{d^2 y(t)}{dt^2} + 5 \frac{dy(t)}{dt} + 6y(t) = -2x(t)$
 b) Find the inverse laplace transform of: 6
 $x(s) = \frac{4}{(s-1)(s+2)}$ if ROC is $-2 < \text{Re}(s) < 1$

UNIT-V

9. a) State and prove the following of Z-Transform 6
 Final value theorem (ii) Time Shifting Property.
 b) An LTI system is characterized by the system function 6

$$H(z) = \frac{3 - 4z^{-1}}{1 - 3.5z^{-1} + 1.5z^{-2}}$$

Verify whether the system is (i) Causal or non causal.
 (ii) Stable or unstable.

(OR)

10. State and prove any four properties of Z-Transform 12

AR18

CODE: 18MEE311

SET-1

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

III B.Tech II Semester Regular Examinations, Sept/Oct-2021

**ROBOTICS
(PROFESSIONAL ELECTIVE-I)
(Mechanical Engineering)**

Time: 3 Hours

Max Marks: 60

Answer ONE Question from each Unit

All Questions Carry Equal Marks

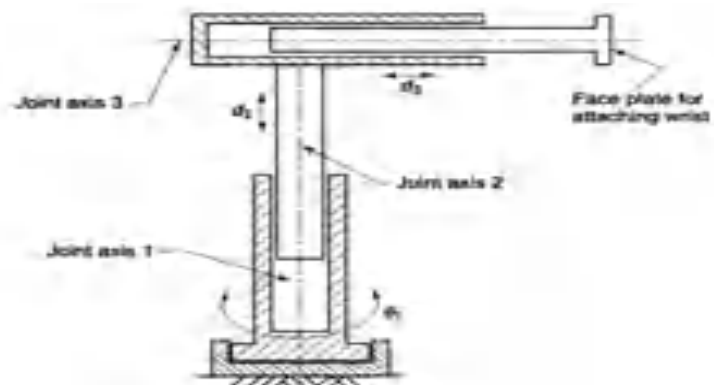
All parts of the Question must be answered at one place

UNIT-I

1. a) What are major components of a robotics system? Explain their functions. 8M
b) Define the following terms 4M
 - i) Work volume
 - ii) Accuracy
 - iii) payload
 - iv) industrial robot
- (OR)**
2. Discuss the performance characteristics of actuators. Compare electrical, pneumatic and hydraulic actuators. 12M

UNIT-II

3. a) Write the homogenous transform matrix for a rotation of 90° about the z axis followed by a rotation of 30° about the x axis, followed by a rotation about Y axis by 60° . 6M
b) What is homogenous transformation of coordinates? Write the homogenous transformation matrix for translation in 3D. 6M
- (OR)**
4. For a 3-DOF manipulator arm shown in figure assign frames and obtain joint link parameters. Also determine the position of tool tip with respect to base frame. 12M



UNIT-III

5. a) A single cubic trajectory is given by $\Theta(t) = 6 + 8t + 22t^2 + 32t^3$ and is used over time interval from $t = 0.5$ to $t = 2.5$. what are the initial and final velocities and accelerations. 8M
- b) Discuss in detail steps followed in trajectory planning. 4M
- (OR)**
6. Determine the expression for joint torques for a planar R-P robotic manipulator using Lagrangian – Euler Formulation 12M

UNIT-IV

7. a) Explain the working of LVDT with a neat sketch 6M
- b) What are the functions of Sensors? Discuss in detail 6M
- (OR)**
8. a) Explain the difference between manual teaching and lead through teaching programming methods. 6M
- b) Explain the different motion instructions used in VAL II 6M

UNIT-V

9. Discuss in detail about various motion planning schemes with examples 12M
- (OR)**
10. a) Discuss the advantages and disadvantages of using robots in industry 6M
- b) Explain function of robots in assembly and inspection. 6M

AR18

CODE: 18ECE321

SET-2

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

III B.Tech II Semester Regular Examinations, Sept/Oct-2021

**TELECOMMUNICATION SWITCHING SYSTEMS & NETWORKS
(Electronics and Communication Engineering)**

Time: 3 Hours

Max Marks: 60

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

1. a) How switching system is connecting the subscribers? Explain about the telecommunication network? 6M
b) What is the significance of sidetone in a telephone conversation 6M
- (OR)**
2. a) Explain the Crossbar switch Configurations 6M
b) Write the different types of switching configurations? 6M

UNIT-II

3. a) Explain in detail about the level3 processing in distributed SPC 6M
b) Write the difference between single stage and multistage networks? 6M
- (OR)**
4. a) Why general-purpose processors are not suitable to carry out event monitoring and distribution? 4M
b) Explain the following terms of software architecture of SPC 8M
Semaphore, deadlock, subroutine, processor, process

UNIT-III

5. a) Explain Subscriber loop interface using Balanced circuit and Two-wire-to four-wire transformer hybrid. 6M
b) Write about Network Traffic load and parameters 6M
- (OR)**
6. a) Briefly explain the three form of signalling techniques 6M
b) Write about Coaxial cable Transmission system. 6M

UNIT-IV

7. a) Define the following terms: protocol, connection-oriented protocols, connectionless protocols, protocol stacks, syntax and semantics 12M
- (OR)**
8. a) List and briefly describe the five basic data communications network topologies 6M
b) explain the utility of layered network architecture 6M

UNIT-V

9. a) Briefly describe circuit, message, and packet switching 6M
b) Describe the conceptual view of ISDN and what is meant by the term digital pipe 6M
- (OR)**
10. a) List and describe the principles and the evolution of ISDN 6M
b) List and describe the ISDN system connections and interface units 6M

AR18

CODE: 18CST315

SET-1

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

III B.Tech II Semester Regular Examinations, Sep/Oct-2021

UNIX INTERNALS

(Computer Science and Engineering)

Time: 3 Hours

Max Marks: 60

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

1. a) Explain the features of UNIX. 6 M
- b) Explain the following UNIX utilities with examples 6 M
i) find ii) cmp iii) diff iv) uniq

(OR)

2. a) Explain grep family with examples 6 M
- b) What is AWK? Describe in detail about different regular expressions supported by AWK. 6 M

UNIT-II

3. a) Write a short note on I/O redirection. 6 M
- b) Write a shell script to find the factorial of a given number. 6 M

(OR)

4. a) Explain arithmetic and conditional expressions in shell with example. 6 M
- b) Write a shell program for finding reverse of a given number. 6 M

UNIT-III

5. a) Explain the following system calls 6 M
i) write() ii) lseek() iii) stat()
- b) Differentiate the following 6 M
i) dup() vs dup2() ii) gets() vs fgets()

(OR)

6. a) Describe about the following directory handling system calls 6 M
i) mkdir() ii) rmdir() iii) chdir()
- b) Explain the role of i) link() ii) symlink() iii) getcwd() 6 M

UNIT-IV

7. a) Define process. How to create new process in UNIX? Explain with example. 6 M
- b) What is an orphan process? Explain with example. 6 M

(OR)

8. a) What is signal handling? Explain any two signals with examples. 6 M
- b) Explain about the following 6 M
i) alarm() ii) pause() iii) abort()

UNIT-V

9. a) What is a pipe? Explain about different types of pipes. 6 M
- b) Describe in detail about shared memory. 6 M

(OR)

10. a) Explain the various IPC mechanisms. 12 M

AR18

CODE: 18ITT301

SET-1

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

III B.Tech II Semester Regular Examinations, Sep/Oct-2021

**INTERNET OF THINGS
(Information Technology)**

Time: 3 Hours

Max Marks: 60

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

1. a) Discuss the importance of MQTT and COAP Protocols. 6M
b) Elaborate the application of IoT in home automation. 6M
(OR)
2. a) Justify the need of cloud computing in IoT. 6M
b) Illustrate IoT level 2 with a neat sketch. 6M

UNIT-II

3. a) Draw the block diagram of M2M gateway and explain each block. 6M
b) Discuss on YANG node types. 6M
(OR)
4. a) Differentiate between conventional network architecture and SDN architecture with neat diagrams. 6M
b) Define SNMP and discuss its limitations. 6M

UNIT-III

5. a) Discuss on domain model specification in IoT design methodology. 6M
b) Explain any two python data types with examples. 6M
(OR)
6. a) Illustrate on information model for weather monitoring IoT system with a neat sketch. 6M
b) Elaborate on any two python packages for IoT with examples. 6M

UNIT-IV

7. a) Illustrate the generic block diagram of single board computer based IoT device. 6M
b) Discuss the key concepts of WAMP. 6M
(OR)
8. a) Explain various components of Raspberry Pi board. 6M
b) Discuss about any two amazon web services for IoT. 6M

UNIT-V

9. a) What is Hadoop Map reduce? Explain the advantages of Map reduce. 6M
b) Describe the components of a storm cluster in Apache storm. 6M
(OR)
10. a) Explain the importance of Amazon Kinesis. 6M
b) Illustrate the key concepts of puppet. 6M

AR16

CODE: 16CE3016

SET-1

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

III B.Tech. II Semester Regular & Supplementary Examinations, Sep/Oct, 2021

**DESIGN AND DRAWING OF STEEL STRUCTURES
(Civil Engineering)**

Time: 3 Hours

Max Marks: 70

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

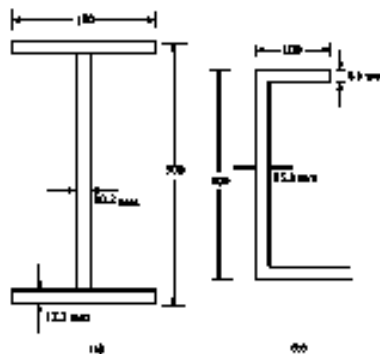
1. a) What are the advantages and disadvantages of welded 4M connections?
b) Explain the specifications of welded connections as per IS 800 : 2007 10M

(OR)

2. a) Neatly sketch the following welded connections: (a) Butt weld (groove weld)-single V, double V (b) Fillet weld (c) Slot weld (d) Plug weld. 8M
b) A tie member of a roof truss consists of 2 ISA 9060, 10 mm. 6M
The angles are connected on the either side of 12 mm gusset plates and the member is subjected to a factored pull of 350 kN. Design the welded connection. Assume welding is to be made in the workshop.

UNIT-II

3. Determine the plastic modules of section of I-section and 14M channel section shown in Fig. about z-z axis. If the shear area of the section is neglected, what percentage of plastic modulus of the section is reduced.



(OR)

4. Design a beam of 5 m effective span, carrying a uniform load of 20 kN/m, if the compression flange is laterally supported. Assume $A_s = 250$ MPa. 14M

UNIT-III

5. a) Explain the different modes of failure of tension members. 4M
b) Determine the tensile strength of a roof truss diagonal 100 x 10M
75 x 10 mm. The longer leg is connected to the gusset plate with 20 mm diameter bolts in one row. Number of bolts used is 6, the edge/end distance=30 mm and pitch=50 mm.

(OR)

6. 12. An upper storey column ISHB 300 @ 577 N/m carries a 14M
factored load of 1200 kN and a factored moment of 12 kN-m.
It is to be spliced with lower storey column ISHB 350 @ 710
N/m. Design a suitable splice.

UNIT-IV

7. The following data refers to a gantry girder on which an 14M
electrically operated crane of capacity 200 kN moves

Span of gantry girder = 6.0 m

Span of crane girder = 18 m

Crane capacity = 200 m

Self-weight of crane girder = 180 kN

Self-weight of trolley = 75 kN

Minimum hook appear = 1.0 m

Distance between wheels = 3.5 m

Self-weight of rails = 0.3 kN/m

Determine

(1) the maximum moment and shear forces due to vertical and horizontal loads

(2) check whether ISMB 600 with ISMC 300 on compression flange is adequate to

(a) carry moment

(b) carry shear force

(c) in buckling resistance

(d) in limiting deflections.

(OR)

8. Illustrate the design steps of a simply supported gantry girder 14M
as per code.

UNIT-V

9. Design a welded plate girder of span 30 m to carry on super 14M
imposed load of 30 kN/m. Avoid use of bearing and
intermediate stiffeners. Use Fe 415 (E250) steel.

(OR)

10. Design a welded plate girder of span 25 m to carry on super 14M
imposed load of 25 kN/m. Using of intermediate stiffeners.
Use Fe 415 (E250) steel.

AR16

CODE: 16EE3019

SET-1

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

III B.Tech. II Semester Regular & Supplementary Examinations, Sep/Oct, 2021

**PLCS & SCADA THEORY
(Electrical And Electronics Engineering)**

Time: 3 Hours

Max Marks: 70

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

- | | | |
|-------|---|-----|
| 1. a) | Outline the block diagram of process automation. | 4M |
| b) | Differentiate between horizontal and vertical integration pertaining to process automation. | 10M |

(OR)

- | | | |
|-------|---|-----|
| 2. a) | Illustrate a two stage automation process describing the sensing and automation scheme. | 4M |
| b) | Discuss the working of encoders and level sensors. | 10M |

UNIT-II

- | | | |
|-------|--|-----|
| 3. a) | Interpret the functional block diagram of PLC system | 4M |
| b) | Describe the functioning of Relay and Motors pertaining to output units of PLC | 10M |

(OR)

- | | | |
|-------|---|-----|
| 4. a) | Illustrate the internal structural aspects of PLC | 4M |
| b) | Describe input, output and communication units of PLC | 10M |

UNIT-III

- | | | |
|-------|---|-----|
| 5. a) | Interpret the terminology of ladder logic programming | 4M |
| b) | Describe coil instructions of ladder programming | 10M |

(OR)

- | | | |
|-------|---|-----|
| 6. a) | Develop ladder programming for two input NAND gate | 4M |
| b) | Obtain ladder program for liquid level control in a tank. | 10M |

UNIT-IV

- | | | |
|-------|--|----|
| 7. a) | Illustrate the successful and unsuccessful OFF delay generation in ladder programming. | 7M |
| b) | Discuss up-down counter instruction of ladder programming. | 7M |

(OR)

- | | | |
|-------|---|----|
| 8. a) | Describe ON delay timer illustrating the timing diagram of the delay operation. | 7M |
| b) | Discuss Subtraction and Division instructions of ladder programming. | 7M |

UNIT-V

- | | | |
|-------|--|-----|
| 9. a) | Define Scan Interval pertaining to SCADA communication interface. | 4M |
| b) | Interpret Main terminal unit interface and describe its functions. | 10M |

(OR)

- | | | |
|--------|---|-----|
| 10. a) | Outline communication system components of SCADA systems. | 4M |
| b) | Describe the analog control scheme of remote terminal unit for non binary decisions | 10M |

AR16

CODE: 16ME3021

SET-1

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

III B.Tech. II Semester Supplementary Examinations, Sep/Oct, 2021

**THERMAL ENGINEERING - II
(Mechanical Engineering)**

Time: 3 Hours

Max Marks: 70

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

1. a) Briefly explain the formation of steam with graphical representation. 7M
b) How can the Rankine cycle efficiency be improved? Explain in detail. 7M
(OR)
2. A Rankine cycle which is working between pressure 100 bar & 0.01 bar and input to turbine is at 350°C. The Isentropic efficiency of Turbine & pump are 85% and 90%. Find Thermal efficiency of Cycle. 14M

UNIT-II

3. a) Differentiate between Water tube boiler and Fire tube boiler. 7M
b) A Chimney is 60m high, the temperature of atmospheric air is 27°C. If 15kg of air per kg of fuel is used, Find for maximum discharge of hot gases 7M
 - i. The temperature of hot gases
 - ii. The draught pressure in mm of water(OR)
4. a) Briefly explain the conditions for maximum discharge through chimney? 7M
b) What is the function of a safety valve in boiler? Explain the various types of safety valves? 7M

UNIT-III

5. a) Dry saturated steam enters a frictionless adiabatic nozzle with negligible velocity at a temperature of 300°C. It is expanded to a pressure of 5000kPa. The mass flow rate is 1kg/s. Calculate the exit velocity of steam. 7M
b) Steam is expanded in a set of nozzles from 10 bar and 200°C to 5 bar. What type of nozzle is it? Neglecting the initial velocity find minimum area of the nozzle required to allow a flow of 3kg/s under the given conditions. Assume the expansion of steam to be isentropic. 7M
(OR)
6. a) Briefly explain the two main classifications of condensers with appropriate sketches? 7M
b) Discuss in detail the effects of air leakage in a condenser? 7M

UNIT-IV

7. a) In an impulse turbine (with a single row wheel), the mean diameter of the blade is 1.05 m and speed is 3000 rpm. The nozzle angle is 18° . The ratio of blade speed to steam speed is 0.42 and ratio of relative velocity at outlet from the blades to that at inlet is 0.84. The outlet angle of the blade is to be made 3° less than the inlet angle. The steam-flow rate is 10 kg/s. Draw the velocity diagram for blades and derive the following: (a) Tangential thrust on the blades, (b) Axial thrust on the blades, (c) Power developed in the blades, (d) Blading efficiency. 10M
- b) Explain the functions of the blading of a reaction turbine? 4M
- (OR)
8. a) With a neat sketch explain the velocity diagram for moving blade. 7M
- b) An outward flow reaction turbine has internal and external diameter of the runner as 0.5 m and 1.0 m respectively. The guide blade angle is 15° and velocity of flow is 4.0 m/s and is constant. If its speed is 200 rpm head 10 m and discharged at outlet is radial find a) runner vane angles at inlet and outlet, b) work done/sec/kg of water, c) Hydraulic efficiency. 7M

UNIT-V

9. a) Explain the concepts of intercooling and reheating in gas turbines? 7M
- b) Briefly explain the working of Ramjet with schematic diagram? 7M
- (OR)
10. A 4500 kW gas turbine generating set operates with two compressor stages, the overall pressure ratio is 9:1. A high pressure turbine is used to drive the compressors, and a low pressure turbine drives the generator. The temperature of the gases at entry to the high pressure turbine is 625°C and the gases are reheated to 625°C after expansion in the first turbine. The exhaust gases leaving the low-pressure turbine are passed through a heat exchanger to heat the air leaving the high pressure stage compressor. The compressors have equal pressure ratios and inter-cooling is complete between the stages. The air inlet temperature to the unit is 20°C . The isentropic efficiency of each compressor stage is 0.8, and the isentropic efficiency of each turbine stage is 0.85, the heat exchanger thermal ratio is 0.8. A mechanical efficiency of 95% can be assumed for both the power shaft and compressor turbine shaft. Neglecting all pressure losses and changes in kinetic energy calculate: (i) The thermal efficiency (ii) Work ratio of the plant (iii) The mass flow in kg/s. 14M
- Neglect the mass of the fuel and assume the following :
- For air: $c_{pa} = 1.005 \text{ kJ / kg K}$ and $\gamma = 1.4$
- For gases in the combustion chamber and in turbines and heat exchanger, $c_{pg} = 1.15 \text{ kJ/kg K}$ and $\gamma = 1.333$.

AR16

CODE: 16EC3024

SET-1

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

III B.Tech II Semester Regular & Supplementary Examinations, Sep/Oct, 2021

TELECOMMUNICATION SWITCHING SYSTEMS

(Elective –I)

(Electronics and Communication Engineering)

Time: 3 Hours

Max Marks: 70

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

1. a) Explain in detail the basic elements of the switching systems [7M]
b) Explain the principles of Crossbar Switching [7M]

(OR)

2. a) Explain the classification of switching systems [7M]
b) Write about evolution of Telecommunications [7M]

UNIT-II

3. a) Explain the operation of Time division time switch [7M]
b) Compare micro programmed control and hard-wired control [7M]

(OR)

4. a) Write about Stored Program Control [7M]
b) Compare time division switching and space division switching techniques. [7M]

UNIT-III

5. a) Explain the design of subscriber loops. [7M]
b) Explain the charging plan for Telecommunication Service. [7M]

(OR)

6. a) What is the need for in channel signalling? [7M]
b) Explain clearly about grade of service and blocking probability. [7M]

UNIT-IV

7. a) Explain the Layered Network Architecture. [7M]
b) Describe the LAN, MAN, and WAN. And list advantages and disadvantages of each network. [7M]

(OR)

8. a) Draw the simplified block diagram of a data communication network and explain. [7M]
b) Write the differences between Connection oriented and Connection less Services. [7M]

UNIT-V

9. a) Explain the Principle of operation of circuit Switching concept with example. [7M]
b) Compare circuit switching and packet switching techniques. [7M]

(OR)

10. a) Explain the Principles and evolution of ISDN. [7M]
b) Write about Broadband ISDN and explain the BISDN configuration. [7M]

Time: 3 Hours**Max Marks: 70**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

UNIT-I

1. a) Elaborate the issues in design of search programs 7
 - b) State and explain the Depth first algorithm with a suitable example. What are the advantages of depth first search? 7
- (OR)**
2. a) Demonstrate water jug problem. 8
 - b) Elaborate simple hill climbing algorithms 6

UNIT-II

3. a) Based the following predicates, answer the question 'Was Marcus loyal to Ceasar? 7
 - i) man(Marcus)
 - ii) Pompeian(Marcus)
 - iii) $\forall x: \text{Pompeian}(x) \rightarrow \text{Roman}(x)$
 - iv) ruler(Caesar)
 - v) $\forall x: \text{roman}(x) \rightarrow \text{loyalto}(x, \text{Caesar}) \vee \text{hate}(x, \text{Caesar})$
 - vi) $\forall x: \exists y: \text{loyalto}(x, y)$
 - vii) $\forall x: \forall y: \text{person}(x) \wedge \text{ruler}(y) \wedge \text{tryassassinate}(x, y) \rightarrow \neg \text{loyalto}(x, y)$
 - viii) tryassassinate(Marcus, Caesar)
 - ix) $\forall x: \text{man}(x) \rightarrow \text{Person}(x)$
 - b) Convert the following facts to into logical propositions. 7
 - i) It is raining ii) It is sunny iii) It is windy
 - iv) If it is raining, it is not sunny v) Socrates is a man
- (OR)**
4. a) By taking suitable examples, explain the various approaches used for representing knowledges. 8
 - b) Briefly explain resolution in predicate logic taking a suitable example. 6

UNIT-III

5. a) Outline the differences between fuzzy sets and crisp sets 6
- b) Taking suitable real world examples, demonstrate the following fuzzy set operations 8
 - i. Union ii. Intersection iii. Complement

(OR)

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| 6. | a) | Demonstrate backward and forward chaining with suitable example | 7 |
| | b) | Elaborate the working of Bayesian theorem. List some real world applications of this theorem | 7 |

UNIT-IV

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|-------------|----|---|---|
| 7. | a) | Illustrate goal stack planning with a suitable example | 8 |
| | b) | Summarize the working principles of hierarchical planning | 6 |
| (OR) | | | |
| 8. | a) | Demonstrate rote learning with a suitable example | 7 |
| | b) | Summarise the working of explanation based learning | 7 |

UNIT-V

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|-------------|----|--|-----|
| 9. | a) | Elaborate the working principles of expert systems. List some well known expert systems. | 3+3 |
| | b) | Illustrate the concepts of explanation and knowledge acquisition in expert systems | 8 |
| (OR) | | | |
| 10. | a) | Explain the process of building an expert system in details. | 7 |
| | b) | Elaborate the additional capabilities an expert system must have in addition to the underlying tasks | 7 |