

AR18

CODE: 18CET315

SET-1

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

III B.Tech II Semester Supplementary Examinations, January-2022

**TRANSPORTATION ENGINEERING-I
(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. a) Write down the classification of roads by Nagpur road plan. 6M
b) Write a note on the road patterns with neat sketches 6M
- (OR)**
2. a) What are the various drawings required to plan an highway effectively 6M
b) Explain briefly various factors which control the highway alignment 6M

UNIT-II

3. a) Derive an expression for overtaking sight distance. 6M
b) For a highway with design speed of 100kmph, determine the safe OSD (assume All other data required) 6M
- (OR)**
4. a) Define super elevation and also derive an expression for super elevation. 6M
b) Explain curve resistance & compensation in gradient on horizontal curves 6M

UNIT-III

5. What are the various tests conducted on bituminous materials? 12M
- (OR)**
6. a) Write about Aggregate Impact Test. 6M
b) Write about aggregate crushing value test. 6M

UNIT-IV

7. a) Write a detailed note on various steps involved in construction of water bound macadam pavements 6M
b) Write a detailed note on various flexible pavement design failures with neat Sketch 6M
- (OR)**
8. a) Discuss in detail how do you provide drainage in water logged areas 6M
b) Discuss in detail maintenance of flexible pavements. 6M

UNIT-V

9. What are the different methods adopted for traffic volume studies. 12M
- (OR)**
10. a) Explain the various types of Traffic islands used 6M
b) Explain different types of intersections 6M

AR18

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SET-1

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

III B.Tech II Semester Supplementary Examinations, January-2022

**POWER SYSTEM ANALYSIS
(Electrical and Electronics 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

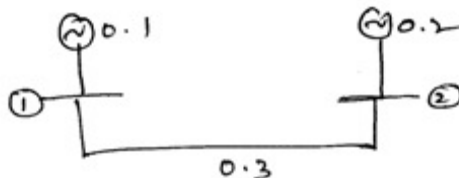
1. a) Draw the single line diagram of a power system indicating the various components of it. Obtain the impedance diagram and reactance diagram. Explain each component and the assumptions made to draw the reactance diagram. 8M
- b) What is per unit quantity? Mention its advantages. 4M
- (OR)**
2. a) Discuss how to form Y Bus by direct inspection with a suitable example. 6M
- b) What are the properties of Ybus & Using singular transformation, derive the expressions for Y_{BUS} 6M

UNIT-II

3. a) Derive the generalized expressions for elements of Jacobian matrix for fast decoupled load flow method. 6M
- b) Derive the expression for the limits of reactive power and discuss how it is considered for PV bus to PQ bus conversion? 6M
- (OR)**
4. a) Discuss various types of buses and their significance? 4M
- b) Draw and explain the equivalent circuit of 3 bus system and derive the static load flow equations. 8M

UNIT-III

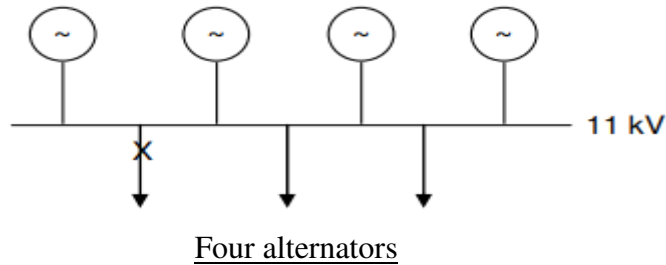
5. a) Derive the expression for bus impedance calculation when a branch is added to the existing partial network. 6M
- b) Determine the Z_{BUS} using building algorithm for the network shown in below figure. The values are in p.u reactance. 6M



(OR)

6. a) Explain in detail about the steps to be followed for the symmetrical fault calculations. 6M

- b) Fig shows four identical alternators in parallel. Each machine is rated for 25 MVA, 11 kV and has a subtransient reactance of 16 % on its rating. Compute the short circuit MVA when a three phase fault occurs at one of the outgoing feeders. 6M



UNIT-IV

7. A double line to ground fault occurs at the terminals of an unloaded generator. Derive an expression for fault current, draw the connection of sequence network. 12M
(OR)
8. a) A 3 phase, 50 MVA, 11KV, star connected neutral solidly grounded generator operating on no load at rated voltage give the following fault currents for the fault specified. 3 phase fault: 2000A, LL fault: 1800A, LG fault: 2200A. Determine the sequence reactances in ohm and per unit. 12M

UNIT-V

9. a) Derive the swing equation as applied to synchronous machine. 6M
b) A 3 phase power system consists of a synchronous generator connected to an infinite bus bar through a lossless double circuit transmission line. A fault occurs on the transmission line. The maximum power transfer for the system when unfaulted is 5 pu and immediately prior to the instant of fault the power transfer is 2.5 pu. The power angle curves during fault and post fault conditions have peak values of 2pu and 4 pu respectively. Determine the critical clearing angle. 6M
(OR)
10. a) Define steady state stability and stability limit. What are the techniques available to improve the steady state stability? 6M
b) A synchronous generator, capable of developing 500MW power per phase, operates at a power angle of 8°. By how much can the input shaft power be increased suddenly without loss of stability? Assume that P_{max} will remain constant. 6M

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

III B.Tech II Semester Supplementary Examinations, January-2022

**DESIGN OF MACHINE MEMBERS - II
(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

Any other data required for the design may be assumed.

UNIT-I

1. a) What are the types of stresses in thick cylinders? 5M
 b) The piston rod of a hydraulic cylinder exerts an operating force of 10 kN. The friction due to piston packing and stuffing box is equivalent to 10% of operating force. The pressure in the cylinder is 10 MPa. The cylinder is made of cast iron FG 200 and factor of safety is 5. Determine diameter and the thickness of the cylinder. 7M
 (OR)
2. A four stroke diesel engine has the following specifications: Brake power=5 kW; Speed=1200 rpm; Indicated mean effective pressure=0.35 N/mm²; Mechanical efficiency=80%. Determine: 1. bore and length of the cylinder; 2. thickness of the cylinder head; and 3. size of studs for the cylinder head. 12 M

UNIT-II

3. Determine the dimensions of cross section of the connecting rod for a diesel engine with the following data: Cylinder bore = 100 mm, Length of connecting rod = 350 mm, Maximum gas pressure = 4 MPa, Factor of safety = 6. 12M
 (OR)
4. Design a side crankshaft when the crank is at the dead centre for a 250 mm × 300 mm gas engine. The weight of the flywheel is 30 kN and the explosion pressure is 2.1 N/mm². The gas pressure at the maximum torque is 0.9 N/mm², when the crank angle is 35° from I. D. C. The connecting rod is 4.5 times the crank radius. 12M

UNIT-III

5. a) What are the applications of power screw? 4 M
 b) A vertical screw with single start square threads of 50 mm mean diameter and 12.5 mm pitch is raised against a load of 10 kN by means of a hand wheel, the boss of which is threaded to act as a nut. The axial load is taken up by a thrust collar which supports the wheel boss and has a mean diameter of 60 mm. The coefficient of friction is 0.15 for the screw and 0.18 for the collar. If the tangential force applied by each hand to the wheel is 100 N, find suitable diameter of the hand wheel. 8M
 (OR)
6. A pulley, made of grey cast iron FG 150, transmits 10 kW power at 720 rpm. The diameter of the pulley is 500 mm. The pulley has four arms of elliptical cross section, in which the major axis is twice of the minor axis. Determine the dimensions of the cross-section of the arm, if factor of safety is 5. 12M

UNIT-IV

7. The following particulars of a single reduction spur gear are given: Gear ratio = 10: 1; 12M
Distance between centres = 660 mm approximately; Pinion transmits 500 kW at 1800 rpm; Involute teeth of standard proportions (addendum = m) with pressure angle of 22.5° ; Permissible normal pressure between teeth = 175 N per mm of width. Find: 1. The nearest standard module if no interference is to occur; 2. The number of teeth on each wheel; 3. The necessary width of the pinion; and 4. The load on the bearings of the wheels due to power transmitted.

(OR)

8. A pair of parallel helical gears consists of a 20 teeth pinion meshing with a 40 teeth gear. 12M
The helix angle is 25° and the normal pressure angle is 20° . The normal module is 3 mm. Calculate (i) transverse module; (ii) transverse pressure angle; (iii) axial pitch; (iv) pitch circle diameters of the pinion and the gear; (v) centre distance; and (vi) addendum and dedendum circle diameters of the pinion.

UNIT-V

9. a) What are journal bearings? Give a classification of these bearings. 4M
b) The load on the journal bearing is 150 kN due to turbine shaft of 300 mm 8M
diameter running at 1800 r.p.m. Determine the following : 1. Length of the bearing if the allowable bearing pressure is 1.6 N/mm^2 , and 2. Amount of heat to be removed by the lubricant per minute if the bearing temperature is 60°C and viscosity of the oil at 60°C is 0.02 kg/m-s and the bearing clearance is 0.25 mm.

(OR)

10. A single row deep groove ball bearing is subjected to a radial force of 8 kN and a thrust 12M
force of 3 kN. The shaft rotates at 1200 rpm. The expected life L_{10h} of the bearing is 20000 hr. The minimum acceptable diameter of the shaft is 75 mm. Select a suitable ball bearing for this application.

AR18

CODE: 18ECT315

SET-2

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

III B.Tech II Semester Supplementary Examinations, January-2022

**MICROPROCESSORS AND MICROCONTROLLERS
(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) | Explain about BIU and EU. | 6 M |
| b) | Explain about Memory Organization of 8086 Microprocessor. | 6 M |
| (OR) | | |
| 2. a) | Draw and Explain Pin Diagram of 8086 Microprocessor. | 6 M |
| b) | Explain about Different Interrupts in 8086 Microprocessor. | 6 M |

UNIT-II

- | | | |
|-------------|--|-----|
| 3. a) | Explain about Different Arithmetic and Logical Instructions. | 6 M |
| b) | Explain about Different Flag Manipulation Instructions | 6 M |
| (OR) | | |
| 4. a) | Explain about Assembler Directives in 8086 Microprocessor. | 6 M |
| b) | Write any Six Differences between Procedure and Macro. | 6 M |

UNIT-III

- | | | |
|-------------|---------------------------------------|------|
| 5. | Draw and Explain 8251 USART | 12 M |
| (OR) | | |
| 6. a) | Explain about 8255 modes | 6 M |
| b) | Draw and explain 8257 DMA Controller. | 6 M |

UNIT-IV

- | | | |
|-------------|---|-----|
| 7. a) | Draw and Explain 80386 Microprocessor modes of operation. | 6 M |
| b) | Explain salient features of 80486 Microprocessor. | 6M |
| (OR) | | |
| 8. a) | Draw and Explain ARM Processor. | 6 M |
| b) | Explain about Interrupt Vector Table in ARM Processor | 6 M |

UNIT-V

- | | | |
|-------------|---|------|
| 9. | With a neat sketch explain the architecture of 8051 Micro controller. | 12 M |
| (OR) | | |
| 10. a) | Explain about various Addressing Modes of 8051 Microcontroller. | 6 M |
| b) | Write an 8051 ALP To copy a Bytes of 8 Bytes of Data to RAM Locations Starting at 50H from Ram Locations 30H. | 6 M |

AR18

CODE: 18CST313

SET-2

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

III B.Tech II Semester Supplementary Examinations, January-2022

**COMPILER DESIGN
(Common to CSE & IT))**

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 the various phases of the compiler? Explain each phase in detail. 6 M
- b) Briefly explain about bootstrapping 6M

(OR)

2. a) Explain the concept of input buffering with suitable example. 6M
- b) Identify the lexemes that make up the token in the following segment indicate corresponding token and pattern. 6M
void comparison(int a, int b)
{
 if (a>b)
 printf(" a is bigger than b");
 else
 printf(" a is smaller than b");
}

UNIT-II

3. Prove that the given grammar is LL(1) grammar. 12 M
 $S \rightarrow aBDh$ $B \rightarrow eC$ $C \rightarrow be/C$ $D \rightarrow EF$ $E \rightarrow g/\epsilon$
 $F \rightarrow f/\epsilon$

(OR)

4. a) Construct the canonical LR for the following grammar. 6M
 $S \rightarrow SS+ | SS* | a$
- b) Explain about YACC Tool. 6M

UNIT-III

5. a) Write short notes on the following 6M
 a) S – attributed definition
 b) L – attributed definition
 c) Dependency Graph
 - b) Explain about Block structure and Non-Block structure storage allocation. 6M
- (OR)**
6. Translate the following arithmetic expression in to $a + a * (b-c) + (b-c) * d$ 12M
 i) Syntax Tree ii) Quadruples iii) Triples
 iv) indirect triples

UNIT-IV

7. a) What is a DAG?. Construct the DAG for the following expression 6M
 $((x+y) - ((x+y)*(x-y))) + ((x+y)*(x-y)).$
b) Explain how copy propagation can be done using data flow equation 6M
- (OR)**
8. a) Discuss various loop optimization techniques. 6M
b) Discuss the redundant sub expression elimination with suitable example. 6M

UNIT-V

9. a) Explain the role of DAG in optimization with an example. 6M
b) Explain about register allocation and assignment. 6M
- (OR)**
10. a) What are the various machine dependent code optimization techniques? 6M
b) Explain in detail the code generation algorithm 6M

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) Describe factors affecting runoff. 6M
b) Explain components of hydrograph with neat sketch of hydrograph. 8M

(OR)

2. a) Define hydrograph. List the assumptions involved in the unit hydrograph theory. 6M
b) The peak of a flood hydrograph due to a 4-h effective storm is 300 cumec. The mean depth of rainfall is 5.9 cm. Assuming an average infiltration loss of 0.3 cm/h, and a constant base flow of 20 cumec, estimate the peak of the 4-h unit hydrograph. 8M

UNIT-II

3. a) Define Darcy's law, unconfined aquifer, confined aquifer, and specific yield. 6M
b) A 30 cm well fully penetrates in an unconfined aquifer of 25 m saturated depth. When a discharge of 2100 lpm was being pumped for a long time. Observation wells at a radial distance 30 m and 90 m indicate drawdown of 5 m and 4 m respectively. Estimate the coefficient of permeability and transmissibility of the aquifer. 8M

(OR)

4. a) Explain intrinsic permeability, well losses, specific capacity of well, and well efficiency. 6M
b) During pumping from confined aquifer with the help of pump from well. The discharge from the fully penetrating well, operating under steady state in that confined aquifer of 30 m thickness is 4000 lpm. The drawdown observed at two observations well located at 15 m and 150 m from the pumping well are 3.5 m and 0.40 m respectively. Determine the transmissibility. 8M

UNIT-III

5. a) Define reservoir storage capacity and explain its different levels. 6M
b) Explain selection of site for a reservoir. 8M

(OR)

6. a) Describe types of reservoirs. 6M
b) Define reservoir sedimentation and explain its causes. 8M

UNIT-IV

7. a) A crop requires 900 mm of water for a base period of 120 days. Find the duty of water. 6M
b) Describe methods of irrigations and explain difficulties in micro irrigation. 8M

(OR)

8. a) Describe crop seasons of India. 6M
b) Explain field capacity, permanent wilting point, ultimate wilting point, and available soil moisture. 8M

UNIT-V

9. a) Define waterlogging, its effect, and causes. 6M
b) Design an irrigation channel in alluvial soil from the following data using Lacey theory. 8M

Discharge = 15 cumec, Lacey's silt factor = 1.0, Side slope = $\frac{1}{2} : 1$.**(OR)**

10. a) Determine Lacey's scour depth for a stream carrying a discharge of 3 cumecs per meter width and having a silt factor of 1.2. 6M
b) Explain canal outlets and canal lining. 8M

AR16

CODE: 16EE3018

SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

III B.Tech II Semester Supplementary Examinations, January-2022

POWER SYSTEM ANALYSIS (Electrical and Electronics Engineering)

Time: 3 Hours

Max Marks: 70

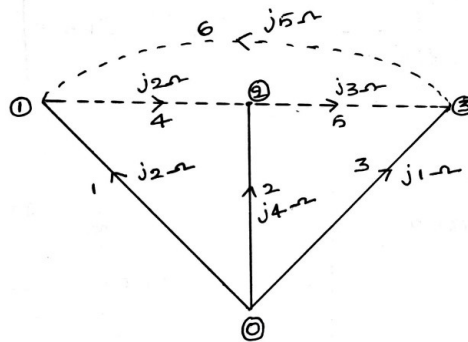
Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

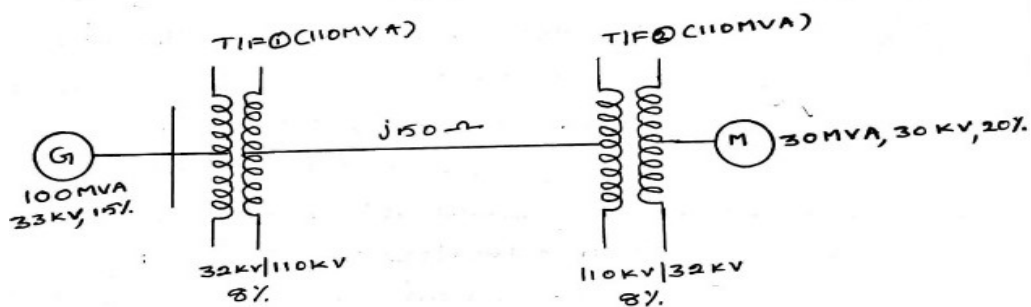
UNIT-I

- 1 Develop the Y-Bus matrix for the power system network show in below figure by using direct inspection method? 14M



(OR)

- 2 a) Outline about per unit system and explain its advantages? 7M
b) Develop per unit reactance diagram for the power system network shown in below figure? 7M

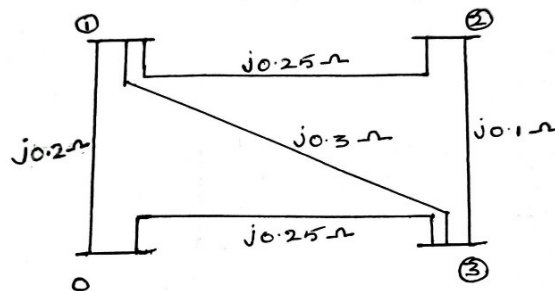


UNIT-II

3. a) What do you know about load flow studies and explain its necessity? 7M
b) List out the assumptions made in fast decoupled load flow method? 7M
(OR)
4. Explain the step by step procedure of GS method of load flow solution? 14M

UNIT-III

5. Develop $[Z]_{\text{Bus}}$ matrix for the power system represented in the following figure 14M



(OR)

6. Two generators are connected in parallel to the LV side of a three phase Δ -Y transformer. Generator 1 is rated 60MVA, 11 KV, Generator 2 is rated 30 MVA, 11 kV with same sub transient reactance of 25%. The transformer is rated 90 MVA at 11 Δ / 132Y kV with reactance of 10%. Determine the fault current in each generator when a three phase short circuit occurs on the HV side of the transformer 14M

UNIT-IV

7. a) Derive an expression of the fault current for a single line to ground fault on unloaded alternator without fault impedance. 7M
b) Illustrate the sequence networks of unloaded alternator? 7M

(OR)

8. A 25 MVA, 13.2 kV alternator with solidly grounded neutral has a sub transient reactance of $j0.25$ p.u. The negative and zero sequence reactance's are $j0.35$ and $j0.1$ p.u. respectively. A line- line fault occurs at the terminals of an unloaded alternator; find the fault current and the line-to-line voltages. Neglect the fault impedance 14M

UNIT-V

9. a) Discuss about classification of stability studies? 7M
b) Tell about significance of equal area criterion in stability studies? 7M

(OR)

10. A large generator is delivering 1.0 pu power to infinite bus through a transmission network. The minimum power which can be transferred to pre fault, fault and post fault conditions are 1.8pu, 0.4pu and 1.3 pu respectively. Find the critical clearing angle. 14M

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)****III B.Tech II Semester Supplementary Examinations, January-2022****DESIGN OF MACHINE MEMBERS – 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) Derive the expression for Lamé's equation cylinder wall thickness? 7M
- b) The piston rod of a hydraulic cylinder exerts an operating force of 10 kN. The friction due to piston packing and stuffing box is equivalent to 10% of the operating force. The pressure in the cylinder is 10 MPa. The cylinder is made of cast iron FG 200 and the factor of safety is 5. Determine the diameter and the thickness of the cylinder. 7M

(OR)

2. A four stroke diesel engine has the following specifications: Brake power = 5 kW; Speed = 1200 r.p.m.; Indicated mean effective pressure = 0.35 N / mm²; Mechanical efficiency = 80 %. Any other data required for the design may be assumed. Determine: 1. Bore and length of the cylinder; 2. Thickness of the cylinder head; and 3. Size of studs for the cylinder head. 14M

UNIT-II

3. Design a connecting rod for a high-speed IC engine using the following data: 14M
Cylinder bore = 125 mm Length of connecting rod = 300 mm Maximum gas pressure = 3.5 MPa Length of stroke = 125 mm Mass of reciprocating parts = 1.6 kg Engine speed = 2200 rpm Assume suitable data and state the assumptions you make.

(OR)

4. Design a centre crankshaft for a single cylinder vertical engine using the following data: 14M
Cylinder Bore = 125 mm; L/r ratio = 4.5; Maximum gas pressure = 2.5 N/mm²; Length of the stroke = 150 mm Weight of flywheel cum pulley = 1 kN; Total belt pull = 2 kN; width of the hub for fly wheel cum belt pulley = 200 mm. The torque on the crank shaft is Maximum. When the crank turns through 25° from the top dead centre and at this position the gas pressure inside the cylinder is 2 N/mm². The belts are in horizontal direction.

UNIT-III

5. a) Discuss the different types of belts and their material used for power transmission 2M
- b) Discuss the various important parameters necessary for the selection of a particular drive for power transmission. 4M
- c) Design a rubber belt to drive a dynamo generating 20 kW at 2250 r.p.m. and fitted with a pulley 200 mm diameter. Assume dynamo efficiency is to be 85%, Allowable stress for belt = 2.1 MPa, Density of rubber = 1000 kg /m³, Angle of 8M

contact for dynamo pulley = 165° , Coefficient of friction between belt and pulley = 0.3

(OR)

6. a) Explain the relative advantages and disadvantages of chain drives over belt drives. 4M
b) Design a roller chain to transmit power from a 20 kW motor to a reciprocating pump. The pump is to operate continuously 24 hours per day. The speed of the motor is 600 r.p.m. and that of the pump is 200 r.p.m. Find: 1. number of teeth on each sprocket; 2. pitch and width of the chain. 10M

UNIT-IV

7. It is required to design a pair of spur gears with 20° full-depth involute teeth based on the Lewis equation. The velocity factor is to be used to account for dynamic load. The pinion shaft is connected to a 10 kW, 1440 rpm motor. The starting torque of the motor is 150% of the rated torque. The speed reduction is 4 : 1. The pinion as well as the gear is made of plain carbon steel 40C8 (Sut = 600 N/mm²). The factor of safety can be taken as 1.5. Design the gears, specify their dimensions and suggest suitable surface hardness for the gears. 14M

(OR)

8. a) What are the advantages of helical gears over spur gears? 4M
b) A pair of helical gears with 30° helix angle is used to transmit 15 kW at 10,000 r.p.m. of the pinion. The velocity ratio is 4 : 1. Both the gears are to be made of hardened steel of static strength 100 N/mm². The gears are 20° stub and the pinion is to have 24 teeth. The face width may be taken as 14 times the module. Find the module and face width from the standpoint of strength and check the gears for wear. 10M

UNIT-V

9. a) Enumerate advantages and disadvantages of rolling-contact bearings over sliding-contact bearings 4M
b) A single row deep groove ball bearing is subjected to a radial force of 8 kN and a thrust force of 3 kN. The shaft rotates at 1200 rpm. The expected life of bearing is 20000 hours. The minimum acceptable diameter of the shaft is 75 mm. Select a suitable ball bearing. 10M

(OR)

10. a) List the important physical characteristics of a good bearing material. 2M
b) Design a Journal bearing for a pump with the following data. 12M
(i) Specific heat $S = 1800 \text{ J/Kg}^\circ\text{C}$
(ii) Heat dissipation coefficient $C = 1240 \text{ W/m}^2/^\circ\text{C}$
(iii) Load on Journal $W = 20,000 \text{ N}$
(iv) Speed of Journal $N = 900 \text{ rpm}$
(v) Absolute viscosity $Z = 0.015 \text{ Kg/m-S}$ at $t_0 = 55^\circ\text{C}$.
(vi) Ambient temperature $t_a = 15^\circ\text{C}$.
(vii) Maximum bearing pressure $P_{\max} = 1.5 \text{ N/mm}^2$.

Calculate the mass of oil required for cooling, if rise in temperature of oil is limited to 10°C

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. What is memory segmentation and explain different segments in 8086 microprocessor. Also, mention the advantages of memory segmentation in 8086 14M
(OR)
2. a) Draw the Flag Register of 8086? Explain the functionality of each bit with a supporting example? 7M
b) Explain about addressing modes in 8086 with an example 7M

UNIT-II

3. CS=0000H, DS=1000H, ES=SS=2000H, BP=BX=SI=DI=A000H & SP=0000H, then explain and indicate the locations from which data required for the following instructions would be fetched: 14M
(i) MOVSB (ii) JMP[BP+10H] (iii) IN AX, DX
(OR)
4. a) Explain the following Instructions (8086) with the help of Syntax? 7M
(i) AAD (ii) CBW (iii) CMPSB (iv) DAS
b) Write an ALP in 8086 to determine the square of the given N-Numbers 7M

UNIT-III

5. Explain with example the virtual 8086 in 80386. Also explain the function of following pins of 80386. 14M
i) BE0 # to BE3 # ii) D/C # iii) LOCK # iv) BUSY #
(OR)
6. a) State the addressing modes of 80386. Give the various exceptions which occur when operating in the Protected Virtual addressing mode. 7M
b) With neat diagram, describe gate descriptor of 80386 microprocessor. 7M

UNIT-IV

7. Explain the basic architecture of 8259 Programmable Interrupt Controller (PIC) with the aid of a block diagram and explain its functioning. 14M
(OR)
8. a) Draw the block diagram of 8255 and explain the function of each block 7M
b) What are the different modes of operation of 8255 Programmable Peripheral Interface (PPI)? 7M

UNIT-V

9. Draw the architecture of the 8051 and describe the limitations of 8051 to design the complex system? 14M
(OR)
10. a) What is an interrupts? Explain IE & IP in 8051. 7M
b) How port-0 is different from other ports of 8051? 7M

AR16

CODE: 16CS3017

SET-2

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

III B.Tech II Semester Supplementary Examinations, January-2022

**COMPILER DESIGN
(Common to CSE & IT)**

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) State the various phases of a compiler and explain them in detail. 10M
b) Specify the functionality of linker, loader, and compiler 4M
(OR)
2. a) Discuss about interpretation. 7M
b) Differentiate pass and phase. List out the functions of a Lexical Analyzer. 7M

UNIT-II

3. Define a Parser. What is the role of grammars in Parser construction? Construct the Predictive parsing table for the grammar 14M
$$G : E \rightarrow E+T \mid T$$
$$E \rightarrow T * F \mid F$$
$$F \rightarrow (E) \mid id.$$

(OR)
4. Compare and contrast SLR with LALR. Define Kernel items and Non-kernel items. 14M
Show the following grammar is LALR(1)
$$S \rightarrow Aa \mid bAc \mid dc \mid bda$$
$$A \rightarrow d$$

UNIT-III

5. a) Explain the use of symbol table in compilation process. 7M
b) List out the various attributes for implementing the symbol table. 7M
(OR)
6. a) Explain the different storage allocation strategies. 7M
b) Discuss in detail about type checkers. 7M

UNIT-IV

7. a) Explain different loop optimization techniques. 7M
b) Discuss in detail about the scope of Optimization. 7M
(OR)
8. a) Construct a DAG for the expression: $a+a*(b-c)+(b-c)*d$ 8M
b) Discuss in detail about global optimization. 6M

UNIT-V

9. a) Explain the concept of Object Code forms. 7M
b) Explain various machine independent code optimization techniques. 7M
(OR)
10. a) Discuss Global Register Allocation in code generation. 7M
b) Generate code for the following C statements: i) $x=f(a)+f(a)$ ii) $y=x/5;$ 7M

AR13

CODE: 13EI3002

SET-2

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

III B.Tech II Semester Supplementary Examinations, January-2022

**INSTRUMENTATION AND CONTROL SYSTEMS
(Mechanical Engineering)**

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) Give the classification of pressure measuring instruments.
b) How can you minimize environmental errors?
c) What materials are used for thermocouples?
d) Name different types of strain gauges.
e) What is the working principle of capacitive transducer?
f) What are the limitations of elastic force meters?
g) What is the main objective of drawing root locus plot?
h) What are examples of open loop systems?
i) How do you know if a system is stable or unstable in a control system?
j) How does phase margin affect stability?

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a) What are the various errors occur in the measuring instruments and explain the methods of elimination. 6M
b) Describe the working of McLeod pressure gauge with suitable sketch. 6M
(OR)
3. a) Explain with the help of suitable sketches, the difference between a Bellow gauge and a diaphragm gauge for pressure measurement. 6M
b) What do you mean by low pressures? List out various indirect methods for measurement of low pressure and explain any two methods. 6M

UNIT-II

4. a) Draw a neat sketch and explain the working of unbonded resistance type strain gauge. 7M
b) What are the different laws involved in thermocouples? Explain the working principle of thermocouple in measurement of temperature. 5M
(OR)
5. a) Explain the principle and working of pyrometers used for measurement of temperature. 5M
b) Sketch and explain the working of a rotameter. 7M

UNIT-III

- a) Explain the construction and working of stroboscope with suitable diagram. 6M
b) Explain the working of hydraulic load cells. 6M

(OR)

7. a) Explain the Capacitive transducer for measurement of displacement with neat sketch. 6M
 b) Explain the principle of linear and rotational type displacement sensing accelerometer. 6M

UNIT-IV

8. a) Distinguish between open loop and closed loop control systems with suitable examples. 6M
 b) How Routh Hurwitz criterion is useful in determining the stability of a control system? 6M

(OR)

9. A unity feedback system is characterized by the open-loop transfer function $G(s) = \frac{1}{s(0.5s+1)(0.2s+1)}$. Determine the steady state errors for unit-step, unit-ramp and unit-acceleration inputs. Also determine the damping ratio and natural frequency of the dominant roots. 12M

UNIT-V

10. The open-loop transfer function of a unity feedback system is given by $G(s) = \frac{K}{s(T_1s+1)(T_2s+1)}$. Derive an expression for gain K in terms of T_1 , T_2 for specified gain margin G_m . 12M

(OR)

11. a) Discuss the various features of the Nyquist stability criterion. 6M
 b) How does phase margin affect stability? Explain. 6M