AR20

CODE: 20CET205 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Regular/Supplementary Examinations, December-2022

FLUID MECHANICS AND HYDRAULIC MACHINES

(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

			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	Explain the phenomenon of capillarity and derive the expression for height of capillary rise.	5	CO1	Understand
	b)	Write a short note on measurement of pressure by using manometers	5	CO1	Understand
		(OR)			
2.	a)	A rectangular plate 1.20m wide and 3.0m deep lies within a water body such that its plane is inclined at 45^0 to the horizontal and the top edge of the plate is 1.40m below the water surface. Determine the total pressure on one side of the plate and the location of the centre of pressure.	10	CO1	Apply
		UNIT-II			
3.	a)	Discuss the procedure to determine the metacentric height of a floating body	5	CO2	Understand
	b)	List out types of fluid flows with an example.	5	CO2	Remember
		(OR)			
4.	a)	For the velocity components in a fluid flow given by $u = 2xy$ and $v = a^2 + x^2 - y^2$, show that the flow is a possible case of study incompressible fluid flow and irrotational flow. Obtain the relevant stream function and velocity potential.	10	CO2	Analyse

UNIT-III

5.	a)	Explain the significance of Bernouli's equation	3	CO3	Understand
	b)	Explain the procedure of Reynold's experiment.	7	CO3	Understand
		(OR)			
6.	a)	A pipeline , 60cm diameter, conveying oil(specific gravity=0.85) at the flow rate of 1800lps has a 90^0 bend in a horizontal plane .The pressure at the entrance to the bend is 1471bar.And the loss of head in the bend is 2m of oil. Find the magnitude and direction of the force exerted by the oil on the bend.	10	CO3	Analyse

UNIT-IV

7.	a)	Derive a condition for maximum velocity of a circular open channel.	7	CO4	Analyse
	b)	Write a short note on most economical sections.	3	CO4	Understand
		(OR)			
8.	a)	Discuss the classification of hydraulic jumps.	5	CO4	Understand
	b)	Write a brief note on energy dissipation	5	CO4	Understand

UNIT-V

9.	a)	Compare the characteristics and working of pelton, Francis and kaplan turbines	10	CO5	Understand
		(OR)			
10.	a)	Derive an expression for the force exerted by a jet on a moving curved vane, when the jet is striking at one end tangentially	7	CO5	Analyse
	b)	Write a short note on efficiencies of turbine.	3	CO5	Understand

UNIT-VI

11.	a)	Explain the characteristic curves of a centrifugal pump.	7	CO6	Apply
	b)	Write a brief note on cavitation.	3	CO6	Understand
		(OR)			
12.		A 3-stage centrifugal pump has impellers 40cm in diameter and 2cm wide at outlet. The vanes are curved back at the outlet at 45° and reduced the circumferential area by 10%. The manometric efficiency is 90%. And overall efficiency is 80%. Determine head generated by the pump running at 1000 rpm and delivering 50L/ sec. What should be the S.H.P required	10	CO6	Apply

AR20

CODE: 20EET205 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Regular/Supplementary Examinations, December,2022

ELECTRICAL POWER GENERATION & DISTRIBUTION

(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

			Marks	CO	Blooms Level
		UNIT-I			
1.		Draw the schematic diagram of a modern thermal power station and explain its operation.	(10M)	CO1	Analyze
		(OR)			
2.	a)	What factors are taken into account while selecting the site for a steam power station?	(5M)	CO1	Remember
	b)	Explain the functions of the following : (i) Spillways (ii) Surge Tank	(5M)	CO1	Understand
		UNIT-II			
3.	a)	Explain the solar energy collector in detail.	(5M)	CO2	Remember
	b)	What are the classifications of nuclear reactors? Describe briefly.	(5M)	CO2	Understand
		(OR)			
4.	a)	Explain the working of a gas turbine power plant with a schematic diagram.	(5M)	CO2	Understand
	b)	Draw the schematic diagram of a nuclear power station and discuss its operation.	(5M)	CO2	Remember
		UNIT-III			
5.	a)	Explain different types of distribution systems with the help of neat sketches.	(5M)	CO3	Remember
	b)	Two conductors of a d.c. distributor cable AB 1000 m long have a total resistance of 0·1 Ω. The ends A and B are fed at 240 V. The cable is uniformly loaded at 0·5 A per metre length and has concentrated loads of 120 A, 60 A, 100 A and 40 A at points distant 200 m, 400 m, 700 m and 900 m respectively from the end A. Calculate (i) the point of minimum potential (ii) currents supplied from ends A and B	(5M)	CO3	Analyze

(OR)

6.		A d.c. ring main ABCDA is fed from point A from a 250V supply and the resistances (including both lead and return) of various sections are as follows: AB=0.02 ohm; BC=0.018 ohm; CD=0.025 ohm and DA=0.02ohm.The main supplies loads of 150A at B; 300A at C and 250A at D. Determine the voltage at each load point. If the points A and C are linked through an interconnector of resistance 0.02 ohm, determine the new voltage at each load point.	(10M)	CO3	Apply

UNIT-IV

7.	a)	What is a substation? Name the factors that should be taken care of while designing and erecting a substation	(5M)	CO4	Remember
	b)	Explain the different types of gas insulated substations in detail.	(5M)	CO4	Understand

(OR)

8.		Draw the key diagram of a typical 33KV/11KV substation and explain about substation equipment	(10M)	CO4	Remember

UNIT-V

9.	a)	What do you understand by the load curve? What informations are conveyed by a load curve?	(5M)	CO5	Remember
	b)	Define the terms (i) Plant capacity factor and (ii) Plant use factor and explain their importance in an electric supply system.	(5M)	CO5	Understand

(OR)

10.	a)	Define the diversity factor and prove that the load factor of supply system is improved by an increase in diversity of load.	(5M)	CO5	Understand
	b)	Estimate the generating cost per kWh delivered from a generating station from the following data : Plant capacity = 50 MW ;Annual load factor = 40% Capital cost = 1.2 crores ; Annual cost of wages, taxation etc. = Rs 4 lakhs ; Cost of fuel, lubrication, maintenance etc. = 1·0 paise/kWh generated. Interest 5% per annum, depreciation 6% per annum of initial value.	(5M)	CO5	Analayze

UNIT-VI

11.	a)	Discuss the different classifications of costs of electrical energy.	(5M)	CO6	Remember
	b)	A consumer has a maximum demand of 200 kW at 40% load factor. If the tariff is Rs. 100 per kW of maximum demand plus 10 paise per kWh, find the overall cost per kWh.	(5M)	CO6	Apply

(OR)

12.		Discuss different types of tariffs.	(10M)	CO6	Apply

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CODE: 20MET204 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Regular/Supplementary Examinations, December, 2022

APPLIED THERMO FLUIDS - 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

			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	Classify types of IC engines based on type of ignition, cooling, cylinder arrangement, method of charging.	4M	CO1	Understand
	b)	Distinguish between SI engine and CI engine.	6M	CO1	Understand
		(OR)			
2.	a)	Distinguish between 2 stroke engine and 4 stroke engine.	5M	CO1	Understand
	b)	Explain the working principle of 4 stroke engine.	5M	CO1	Understand
		UNIT-II			
3.	a)	Explain about Octane number and Cetane number.	5M	CO2	Understand
	b)	Explain about flash point and fire point.	5M	CO2	Understand
		(OR)			
4.		The air flow to a four cylinder, four-stroke oil engine is measured means of a 5 cm diameter orifice having a coefficient of discharge of 0.6. During a test on the engine the following data were recorded: bore = 10 cm; stroke = 12 cm; speed = 1200 rpm; brake torque = 120 Nm; fuel consumption = 5 kg/h; calorific value of fuel = 42 MJ/kg; pressure drop across orifice is 4.6 cm of water; ambient temperature and pressure are 17 ◦C and 1 bar respectively. Calculate (i) the thermal efficiency on brake power basis; (ii) the brake mean effective pressure and (iii) the volumetric efficiency based on free air condition.	10M	CO2	Apply
		UNIT-III			
5.	a)	Discuss about the parameters affecting flame propagation of combustion in SI engines.	5M	CO3	Understand
	b)	Explain the stages of combustion in SI engines.	5M	CO3	Understand
		(OR)			
6.	a)	Explain about the variables affecting the delay period in CI engines.	5M	CO3	Understand
	b)	Explain the stages of combustion in CI engines.	5M	CO3	Understand

UNIT-IV

7.		Derive an expression for the force excreted by a jet of water in the direction of jet. i) On a flat vertical plate moving ii) On a flat inclined plate moving.	10M	CO4	Apply

(OR)

8.		A Francis turbine with an overall efficiency of 75% is required to produce 148.25 KW. It is working under a head of 7.62 m. The peripheral velocity is $0.26\sqrt{2gH}$ and the radial velocity of flow at inlet is $0.96\sqrt{2gH}$. The wheel runs at 150 r.p.m and the hydraulic losses in the turbine are 22% of the available energy. Assume radial discharge, determine (i) the guide blade angle (ii) the wheel vane angle at inlet, (iii) diameter of the wheel at inlet, (iv) width of the wheel at inlet.	10M	CO4	Apply

UNIT-V

9.	a)	Explain the working principle of centrifugal pump with a neat sketch.	5M	CO5	Understand
	b)	Derive an expression for specific speed of a centrifugal pump.	5M	CO5	Understand

(OR)

10.		A single stage centrifugal pump with impeller diameter of 30 cm rotates at 2000 rpm and lifts 3 m^3/s. to a height of 30 m with an efficiency of 75% . Find the number of stages and diameter of each impeller of a similar multistage pump to lift 5 m^3/s to a height of 200 m when rotating at 1500 rpm.	10M	CO5	Apply

UNIT-VI

11.	a)	Distinguish between perfect and imperfect intercooling.	4M	CO6	Understand
	b)	A single stage reciprocating air compressor is required to compress 1 kg of air from 1 bar to 5 bar. The initial temperature is 27 ^oC. Compare the work requirement in the following cases. 1. Isothermal compression 2. Compression with $PV^{1.25}$ = constant 3. Isentropic compression.	6M	CO6	Apply

(OR)

12.	a)	Explain the working principle of reciprocating pump with a neat sketch.	5M	CO6	
	b)	Define indicator diagram. Prove that area of indicator diagram is proportional to the work done by the reciprocating pump.	5M	CO6	

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CODE: 20ECT204 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Regular/Supplementary Examinations, December-2022

DIGITAL ELECTRONICS

(Electrical 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

			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	Convert the following decimal numbers to octal. (i) 6593 (ii) 4275	5M	CO1	Apply
	b)	Write about r's and (r-1)'s complement with examples.	5M	CO1	Understand
		(OR)			
2.	a)	Perform BCD addition of (277)10 and (389)10 ?	5M	CO1	Apply
	b)	Encode the binary word 1100 into seven bit odd parity hamming code?	5M	CO1	Apply
		UNIT-II			
3.	a)	List down the 5 theorems of boolean algebra, with each covering both `or` operator and `and` operator where applicable	5M	CO2	Understand
	b)	Implement [(CD)'+A]'+A+CD+AB using NOR gates	5M	CO2	Apply
		(OR)			
4.	a)	Minimize the following Boolean function into sum of products $F1(A,B,C,D)= \prod(0,1,4,9,11)$	5M	CO2	Apply
	b)	Determine the prime-implicants of the following function $F1(A,B,C,D)= \sum(1,4,6,7,8,9,10,11,15)$	5M	CO2	Apply
		UNIT-III			
5.	a)	Explain about full-subtractor using a truth table and also design their circuits.	5M	CO3	Understand
	b)	Explain how to construct full-adder using two half adders.	5M	CO3	Understand
		(OR)			
6.	a)	Design 4 bit BCD Adder	5M	CO3	Apply
	b)	Design a combinational circuit that can convert a 4-bit binary code to corresponding 4-bit grey code.	5M	CO3	Apply

UNIT-IV

7.	a)	Define and describe a 2 X 4 decoder with enable input using a truth table and realize it using appropriate number of AND gates.	4M	CO4	Understand
	b)	Design LED seven segment display.	6M	CO4	Apply
		(OR)			
8.	a)	Define and describe a 1 X 4 de-multiplexer using truth table and realize it using a circuit with AND gates.	5M	CO4	Understand
	b)	Design 8x1 Multiplexer	5M	CO4	Apply

UNIT-V

9.	a)	Describe the behavior of JK Flip-flops in detail using truth table.	5M	CO5	Understand
	b)	Design a 4-bit bi-directional shift register, realize the design through a circuit and describe it using function table.	5M	CO5	Apply
		(OR)			
10.	a)	Construct a 5-bit ring counter and explain how many distinct timing signals it can generate	5M	CO5	Apply
	b)	Convert J K flip flop to T flipflop	5M	CO5	Apply

UNIT-VI

11.	a)	Write the HDL Gate level description of 2-to-1 line multiplexer with enable	5M	CO6	Apply
	b)	Write the HDL data flow description of the 4 bit priority encoder	5M	CO6	Apply
		(OR)			
12.	a)	Write the HDL Gate level description of 3bit Adder.	5M	CO6	Apply
	b)	Write the HDL Data flow description of 3 bit subtractor	5M	CO6	Apply

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CODE: 20CST204 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Regular/Supplementary Examinations, December-2022

OBJECT ORIENTED PROGRAMMING

(Common to CSE, IT & AIML)

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

			Marks	CO	Blooms Level
		UNIT-I			
1.	a)	Explain the functionality of The Java Virtual Machine.	5M	CO1	1
	b)	Write a program on Factorial Program using loop in java.	5M	CO1	1
		(OR)			
2.	a)	Explain Naming Conventions of the Different Identifiers.	5M	CO1	1
	b)	Explain Automatic type Conversion in Java with examples.	5M	CO1	1
		UNIT-II			
3.	a)	Explain the following A. garbage collection, B.finalize() method	5M	CO2	2
	b)	Describe Methods in java in detail.	5M	CO2	2
		(OR)			
4.	a)	What is Recursion? Discuss types of recursion.	5M	CO2	1
	b)	Write a program and recurrence relation to find the Fibonacci series of n where n>2 .	5M	CO2	1
		UNIT-III			
5.	a)	Difference between Multi-level Inheritance & Hierarchical Inheritance.	5M	CO3	1
	b)	Illustrate Dynamic Method Dispatch in Java.	5M	CO3	2
		(OR)			
6.	a)	Explain Method overriding in java with example	5M	CO3	2
	b)	Difference between Abstract Classes vs. Interfaces	5M	CO3	3
		UNIT-IV			
7.	a)	Explain Importing Packages in java.	5M	CO4	1
	b)	Describe Exception-handling fundamentals in detail.	5M	CO4	2
		(OR)			
8.	a)	Describe the following A. Built-in Exception, B. User Defined Exception	5M	CO4	1
	b)	Explain Different Types of Packages in Java	5M	CO4	1
		UNIT-V			
9.	a)	Explain Thread Synchronization in Java	5M	CO5	2
	b)	Discuss Thread Priorities in detail	5M	CO5	3
		(OR)			
10.	a)	What is Thread in java?Discuss Advantages of Java Multithreading	5M	CO5	1
	b)	How to create threads and run in Java.	5M	CO5	2
		UNIT-VI			
11.	a)	Discuss Lifecycle of Java Applet	5M	CO6	2
	b)	Write a program to demonstrate how to run a simple Applet in Java	5M	CO6	2
		(OR)			
12.	a)	Illustrate HTML applet tag in Java.	5M	CO6	2
	b)	Explain Applet Parameters in Java.	5M	CO6	3

AR18

CODE: 18CET202 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, January,2023

FLUID MECHANICS-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)	State and Prove Pascal's law.	6M
	b)	A 400 mm diameter shaft is rotating at 200 r.p.m.in a bearing of length 1.20 mm. If the thickness of oil film is 1.5 mm and the dynamic viscosity of the oil is 0.7 Ns/m^2, determine: (i) Torque required to overcome friction in bearing; (ii) Power utilized in overcoming viscous resistance.	6M
		(OR)	
2.	a)	U-tube manometer containing mercury was used to find the negative pressure in the pipe, Containing water. The right limb was open to the atmosphere. Find the vacuum pressure in the pipe, if the difference of mercury level in the two limbs was 100 mm and height of water in the left limb from the centre of the pipe was found to be 40 mm below.	6M
	b)	Define Viscosity? Explain how viscosity vary with temperature in liquids and gases.	6M

UNIT-II

3.	a)	What is centre of buoyancy? Explain briefly the types of equilibrium of floating bodies.	6M
	b)	A rectangular plane surface 2m wide and 3m deep lies in water in such a way that its plane makes an angle of 30^0 with the free surface of water. Determine the total pressure and position of centre of pressure when the upper edge is 1.5m below the free surface?	6M
		(OR)	
4.		A wooden block of specific gravity 0.75 floats in water. If the size of the block is 1 m × 0.5 m × 0.4 m, find its metacentric height.	12M

UNIT-III

5.	a)	Explain the methods of drawing flownets.	6M
	b)	The velocity potential function is given by an expression $\phi=x^2-y^2$. Find the velocity components in x and y direction and show that ϕ represents a possible case of flow?	6M
		(OR)	
6.		Derive continuity equation in 3-dimensional cartesian coordinate system.	12M

UNIT-IV

7. a) Explain the characteristics of laminar and turbulent flows. 6M
   b) A 45^0 reducing bend is connected in a pipe line, the diameters at the inlet and outlet of the bend being 600mm and 300mm respectively. Find the force exerted by water on the bend if the intensity of pressure at inlet to bend is 8.829 N/cm^2 and rate of flow of water is 600 liters/s. 6M

(OR)

8. a) List the assumptions which are made while deriving Bernoulli's equation. What are the limitations of the Bernoulli's equation? 6M
   b) A pipe 300 metres long has a slope of 1 in 100 and tapers from 1.0 m diameter at the higher end to 0.5 m at the lower end. Quantity of water flowing is 90 litre/s. If the pressure at higher end is 70 kN/m^2, find the pressure at the lower end. 6M

UNIT-V

9. a) Derive the expression for discharge through a Venturimeter. 6M
   b) Find the discharge through a trapezoidal notch which is 1 m wide at the top and 0.4 m at the bottom and is 30 cm in height. The head of water on the notch is 20 cm. Assume C_d for rectangular portion as 0.62 while for triangular portion as 0.6. 6M

(OR)

10. Derive Darcy-weisbach equation? 12M

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AR18

CODE: 18EET206 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B. Tech I Semester Supplementary Examinations, January,2023

ELECTRICAL MACHINES-I

(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) Define commutation. Explain the process of commutation in dc generators with neat sketches. 6M
   b) Distinguish between self and separately excited dc generators. How are self-excited dc generators classified? Give their circuit diagrams. 6M

(OR)

2. a) Derive an expression for EMF equation in DC machines? 6M
   b) An 8 pole, lap-connected DC generator has 12 coils with 8 turns per coil. It is driven at 1800 rpm. If the flux per pole is 30mwb, calculate the emf generated. If the machines are wave connected find the speed at which it is to be driven to generate the same emf as calculated with lap connected. 6M

UNIT-II

3. a) What are the conditions to build up of emf in dc shunt generator? 6M
   b) The magnetization characteristics of a shunt generator at 1000rpm. is as follows: 6M

OC Volts	62.5	107.5	155.0	196.5	231.0	256.0	275.0	287.5
Field Amperes	1.0	2.02	3.0	4.0	5.0	6.0	7.0	8.0

Estimate the no-load terminal voltage of the machine when run at 800 rpm with 30Ω filed circuit resistance.

(OR)

4. a) Explain D.C shunt motor characteristics. 6M
   b) A 6 pole, lap wound shunt motor has 500 conductors in the armature. The resistance of armature path is 0.05 Ω. The resistances of shunt field winding are 25 Ω. Find the speed of the motor when it takes 120A from dc mains of 100V supply. Flux per pole is $2*10^{-2}$wb. 6M

UNIT-III

5. a) Describe and compare various methods of speed control of dc motors? 6M
   b) A DC shunt motor runs at 750 rpm from 250 V supply and is taking a full load line current of 60 A. Its armature and field resistances are 0.4 Ω and 125 Ω respectively. Assuming 2 V brush drop and negligible armature reaction effect, calculate the no load speed for a no-load line current of 6 A and resistance to be added in series with armature circuit to reduce the full load speed to 600 rpm. 6M

(OR)

6. a) Derive the condition for maximum efficiency of a D.C. machine. 6M
   b) The following readings are obtained when performing a brake test on DC shunt motor. Spring Balances are 8 Kgs and 30 Kgs. Diameter of the drum is 42 cm. Speed of the motor is 1000 rpm, applied voltage is 220 volts line current is 50A calculate output power and efficiency. 6M

UNIT-IV

7. a) Explain briefly the action of a transformer and show that the voltage ratio of the primary and secondary windings is the same as their turn's ratio. 6M

   b) b) A single-phase transformer has 400 primary and 1000 secondary turns. The net cross- sectional area of the core is 60 cm2. If the primary winding be connected to a 50 Hz supply at 500 V, calculate i) the peak value of the flux density in the core, and ii) the voltage induced in the secondary winding. 6M

(OR)

8. a) What are the different losses in a transformer? Derive the Maximum efficiency of the transformer. 6M

   b) Find the All-day efficiency of a transformer having a maximum efficiency of 98% at 15 KVA at unity power factor and loaded as follows: 12 hours-2KW at 0.5 pf lag, 6 hours-2KW at 0.8 pf lag, 6 hours- at no load. 6M

UNIT-V

9. a) With circuit diagrams explain Open Circuit & Short Circuit tests conducted on single phase transformer. 6M

   b) Calculate the full load efficiency & the secondary terminal voltage of a transformer with 4KVA 200/400V 1-phase 50HZ for unity and 0.8 lagging from the following results 6M

O.C test: 200V	0.8A	70Watts
S.C Test: 20V	10A	60Watts.

(OR)

10. a) Explain the significance of vector groupings of transformers? 6M

    b) Two transformers A and B are joined in parallel to the same load. Determine the current by each transformer having given open circuit EMF 6600V for A and 6400V for B. leakage impedances in terms of secondary 0.3+j3 ohms for A and 0.2+j1ohms for B. The load impedance is 8+j6 ohms. 6M

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AR18

CODE: 18MET201 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, January,2023

THERMODYNAMICS

(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)	A mass of gas is compressed in a quasi-static process from 80kPa, 0.1 m^3 to 0.4 MPa, 0.03 m^3. Assuming that the pressure and volume are related by pV^n=Constant, find net work done by the gas system assume n=1.4	6
	b)	Characterize a system and explain how systems are classified	6
		(OR)	
2.	a)	The molar enthalpy of fusion for ice at 0.0°C and a pressure of 1.00 atm is 6.01 kJ, and the molar volumes of ice and water at 0°C are 0.0197 L and 0.0180 L, respectively. Calculate ΔH and ΔU for the melting of ice at 0.0°C.	6
	b)	Reversible and Irreversible process with neat sketches	6

UNIT-II

3.	a)	A gas in a system has constant pressure. The surroundings around the system lose 62 J of heat and does 474 J of work onto the system. What is the internal energy of the system?	6
	b)	Derive the Steady Flow Energy Equation of a turbine with a neat sketch by clearly stating the assumptions	6
		(OR)	
4.	a)	Perpetual Motion Machines (PMM) of first kind and second kind	6
	b)	Derive the expression for change of entropy for the following processes. a) Isochoric process b) Isobaric process c) Isotherm process	6

UNIT-III

5.	a)	80 kg of water at 100°C are mixed with 50 kg of water at60°C, while the temperature of the surroundings is 15°C. Determine the decrease, increase and loss in availability due to mixing.	6
	b)	Helmholtz function and Gibbs function with examples	6
		(OR)	
6.	a)	Characterize critical point and Triple point with examples	6
	b)	Find the specific volume, internal energy and entropy of wet steam at 16 bar pressure and dryness fraction 0.9.	6

UNIT-IV

7.	a)	Show that $pV^{\gamma} = RT$ executing cyclic relation by an ideal gas.	6
	b)	Setup an expression for the partial pressure of a gas in the gaseous mixture in terms of mass and volume fraction.	6

(OR)

8.	a)	Describe Dalton's Law of partial pressure	6
	b)	Explain about Avogadro's Laws of additive volumes	6

UNIT-V

9.	a)	Compare Otto, Diesel and Dual cycles for same compression ratio and heat rejection with p-V and T-S diagrams	6
	b)	An air standard dual cycle has a compression ratio of 15 and compression begins at 0.1 MPa, 40°C. The maximum pressure is limited to 6 MPa and the heat added is 1.675 MJ/kg. Compute (a) the cycle efficiency, (b) the temperature at the end of the constant volume heating process, (c) the cut-off ratio, and the m.e.p. of the cycle	6

(OR)

10.		Derive an expression for the efficiency and mean effective pressure of the Diesel cycle	12

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AR18

CODE: 18ECT205 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, January,2023

ELECTRONIC CIRCUITS ANALYSIS

(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)	Derive the condition for frequency of oscillation in an RC phase shift oscillator.	6M
	b)	State and derive Barkhausan criterian for the oscillations.	6M

(OR)

2.	a)	Derive the oscillation condition for LC circuits	6M
	b)	Derive the frequency of oscillation of Hartley oscillator	6M

UNIT-II

3.	a)	State and explain Millers theorem	5M
	b)	Draw the CE amplifier with un bypassed emitter resistance and derive the expression for its Ri and Av.	7M

(OR)

4.	a)	Draw the CC amplifier and derive the expression for A_I, R_I, A_V, Y_O.	6M
	b)	Derive the expression for voltage gain of a common source FET amplifier	6M

UNIT-III

5.	a)	Derive the expression for the bandwidth of a multi stage amplifier.	6M
	b)	Derive the overall current gain and overall input impedance of a Darlington pair Amplifier.	6M

(OR)

6.	a)	Derive and draw the frequency response and analysis of two stage RC coupled Amplifier	8M
	b)	Write short notes on Cascode amplifiers.	4M

UNIT-IV

7.	a)	Derive the expression for CE short circuit Current gain	6M
	b)	Derive for the Current Gain of hybrid – π model of CE amplifier with Resistance Load.	6M

(OR)

8.	a)	Derive the expressions for the following hybrid Π conductance i) g_m ii)$g_{b'e}$ iii) $g_{b'c}$	6M
	b)	Draw the hybrid-π model of common emitter configuration and describe each Component in the π-model.	6M

UNIT-V

9.	a)	Draw the equivalent circuit of a double tuned amplifier and derive the gain at resonance.	6M
	b)	Draw the circuit diagram of complementary symmetry class B push pull amplifier and explain its working	6M

(OR)

10.	a)	Derive an expression for tuning frequency of a single tuned amplifier in terms of Quality factor and bandwidth of the amplifier?	6M
	b)	Draw the circuit diagram the working of a transformer coupled class 'A' power amplifier	6M

AR18

CODE: 18CST203 SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, January,2023

OBJECT ORIENTED PROGRAMMING

(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)	Explain the basic principles of object oriented programming?	6M
	b)	Discuss about Naming Conventions in Java.	6M
		(OR)	
2.	a)	Explain about Java Buzzwords.	6M
	b)	Define datatype? Explain about types of datatypes in java .	6M

UNIT-II

3.	a)	Define Constructor? Explain about types of Constructors with example.	6M
	b)	Explain briefly about Method overloading with example.	6M
		(OR)	
4.	a)	Define Method? Explain about types of methods with example.	6M
	b)	Explain about final keyword with example.	6M

UNIT-III

5.	a)	Define Inheritance? Explain about Types of Inheritance with example.	6M
	b)	Discuss about Method Overriding with example.	6M
		(OR)	
6.	a)	Explain about Abstract Classes with example.	6M
	b)	Discuss how Multiple Inheritance is achieved using Interface with example.	6M

UNIT-IV

7.	a)	Define package? Explain different types of packages.	6M
	b)	Explain about different types of Exceptions in java.	6M
		(OR)	
8.	a)	Define Exception? Explain about Exception handling mechanism with example.	6M
	b)	Explain the process of creating and importing a package.	6M

UNIT-V

9.	a)	Define Thread? Explain about Thread Life cycle with neat diagram?	6M
	b)	Explain about passing parameters to an applet with example.	6M
		(OR)	
10.	a)	Explain about Synchronization of threads in java with example.	6M
	b)	Write a simple applet program to display “Hello world” message.	6M

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AR16

CODE: 16EE2007 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Supplementary Examinations, January,2023

ELECTRICAL MACHINES-I

(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) Explain the working principle of DC Generator and function of Commutator — 7 M
   b) A 300 KW,600 V long shunt compound generator shunt field resistance=75 Ω and armature resistance 0.03 Ω commutation field winding resistance 0.011 Ω , series field resistance = 0.012 Ω , diverter resistance = 0.036 Ω calculate voltage and power generated by the armature — 7 M

(OR)

2. a) What is meant by armature reaction how it effects the DC machines and mention the way to resolve armature reaction in Dc Machines — 7 M
   b) A 4 pole wave wound motor armature has 880 conductors and delivers 120 A. The brushes has been displaced through 3 angular degrees from the geometrical axis calculate
   i) demagnetising ampere turns per pole ii) cross magnetising amp turns per pole iii) additional field winding current for neutralizing the demagnetisation of the field winding has 1100 turns per pole — 7 M

UNIT-II

3. a) Explain the internal and external characteristics of self exited generators and give the applications of each machine based on the characteristics — 7 M
   b) Explain how the process of voltage induces for self excited generators. — 7 M

(OR)

4. a) Explain the significance of Back EMF in DC motor and working principle of a DC motor — 7 M
   b) Determine the developed torque and shaft torque of a 220 V 4 pole series motor with 800 conductors wave connected supplying a load of 8.2 KW by taking 45 A from the mains the flux per pole is 25 m Wb and its armature circuit resistance is 0.06 Ω — 7 M

UNIT-III

5. a) Explain about swimburne test on DC Machine mention its advantages and disadvantages — 7 M
   b) The no load test of 44.76 KW 220 V DC Shunt motor gave the following data input current :13.25 A ,field current :2.25 A , resistance of armature :0.032 ohm and brush drop 2 V calculate full load current and efficiency — 7 M

(OR)

6. a) how a DC Series motor speed can be control what are the types of speed control techniques — 7 M
   b) Explain about ward Leonard method and its application — 7 M

UNIT-IV

7. a) Explain the operation of a transformer with and without load with representation of phasor diagram. — 7 M
   b) A 25 KVA single phase transformer has 250 turns on the primary and 40 turns on the secondary. The primary is connected to 1500 V , 50 Hz calculate the primary and secondary full load currents , secondary emf , maximum flux in the core — 7 M

(OR)

8. a) How all day efficiency differences from normal efficiency. Mentions the types of losses in transformer. — 7 M
   b) A 30 KVA 2400/120 V 50 Hz transformer has a high voltage winding resistance of 0.1 Ω and leakage resistance of 0.22 Ω the low voltage winding resistance 0.035 Ω and the leakage reactance is 0.012 Ω find the equivalent resistance , reactance , impedance refereed to i) High voltage side ii) Low voltage side — 7 M

UNIT-V

9. a) Why we are moving towards a three phase transformer and mention the advantages and disadvantages compared to three single phase transformer using a 3 phase unit — 7 M
   b) mention the condition for parallel operation of transformer for a single and three phase transformers — 7 M

(OR)

10. a) Explain about sumpner test how it is different from OC and SC test — 7 M
    b) In load test of a single phase transformer the following data are primary voltage 210 V and secondary voltage 110 V, primary current 0.5 A , input power 30 W find i) turns ratio ii)magnetising component of no load current iii)working component iv) Iron loss , resistance of the primary winding 0.6 Ohms draw the no load phasor diagram to scale — 7 M